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CONTENTS

	PAGE
Editorials	93
Letters to the Editor	98
Publications Received	99
The Scrap Heap	100
Overseas Railway Affairs	101
Our Centenary—Messages from Readers	103
Impressions of Overseas Transport	104
Station Truck Working on the G.W.R.	105
Passenger Traffic Statistics, 1923–34	107
New Coaches and Buffet Cars, G.N.R. (Ireland)	110
Southern Railway and Naval Review	111
New 4-6-2 Express Locomotives, L.M.S.R.	113
Improvements at Doncaster Works, L.N.E.R.	116
Locomotive Blast-Pipe Trials in India	118
Railway News Section	119
Personal	119
Contracts and Tenders	126
Railway Share Market	128

Restriction or Fulfilment?

THE International Chamber of Commerce has for some time been investigating the recent evolution of road and rail transport, and, at its Paris Congress last month, summed up its conclusions in a resolution defining "the principles which should govern the organisation of land transport." The key to these principles is to be found in the following sentence: "The total means of transport offered to the public should not exceed the real need of business." Within that frame of reference, the principles enunciated are sound, and indicate means for the restriction of transport services. Nevertheless we will not subscribe to the defeatist attitude summed up in the key sentence quoted above. Our definition of a proper frame of reference would read as follows: "The total means of transport offered to the public should not exceed the real *wants of the people*." Only the people themselves can say what their wants are; what is beyond controversy is that their wants are greater than can be satisfied by their present incomes. At the same time the wants of every transport organisation today are prevented from fulfilment by the very fact that the people cannot afford to use the output potentially available. The paramount problem of transport undertakings is how to dispose of their services at a remunerative price. If only the International Chamber of Commerce would undertake a thorough investigation along these lines it would, we feel quite certain, be able to make an invaluable contribution to human progress.

Three Months' Goods Train Traffics

Freight train traffics of all standard gauge railways in Great Britain for the twelve weeks ended March 23, 1935, showed on the whole a fall of 1·58 per cent. in units and of 2·34 per cent. in receipts compared with the corresponding period of 1934 as indicated in the analysis published with the Ministry of Transport statistics for the month of March, 1935. In the higher class merchandise tonnage of 10,709,505 there was a fall of 255,090 tons or 2·33 per cent., but the receipts of £8,994,860 declined by £153,329 or 1·68 per cent., and were £696,957 higher than for the corresponding period of 1933. Of minerals and merchandise (classes 1-6) 11,863,923 tons were carried, an increase of 238,804 tons or 2·05 per cent., although in the receipts of £3,100,175 there was a decrease of £17,318 or 0·56 per cent. compared with the corresponding period of 1934, when there was an advance of 28·12 per cent. on the first twelve weeks of 1933. Coal, coke, and patent fuel tons numbered 43,204,424, a decrease of 1,022,841 tons or 2·31 per cent., producing receipts of £8,071,694, which were lower by £308,803 or 3·68 per cent. than those for the corresponding twelve weeks in 1934. Net ton-miles were 2·61 per cent. less, and the freight engine mileage was 0·82 per cent. less. Net ton-miles per freight train engine hour increased by 2·14 per cent.

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The Week's Traffics

Since the turn of the half year there has been an appreciable improvement in merchandise takings of three of the four group companies, and the change is particularly welcome on the L.N.E.R. which has now reduced its decrease in this class of receipts to £50,000. Aggregate increases in general merchandise for the 28 weeks are £45,000 on the L.M.S.R. and £52,000 on the Great Western, but the Southern still shows a decrease of £101,500. For the four companies together the total receipts for the year to date are £77,953,000, an increase of £536,000 or 0·69 per cent. Each company has a substantial advance in passenger train takings, which for the four railways amount to £33,773,000, an increase of £776,000 or 2.35 per cent. Merchandise receipts aggregate £27,814,500, a decrease of £54,500 or 0·20 per cent. In the coal class receipts of £16,365,500 for the 28 weeks earned by the four companies there is a decrease of £16,365,500 or 1·12 per cent.

	28th Week				Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total.	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S R. ..	+ 28,000	+ 17,000	− 2,000	+ 43,000	+ 371,000	+ 1·19
L.N.E.R. ..	+ 9,000	+ 19,000	− 3,000	+ 25,000	+ 22,000	+ 0·096
G.W.R. ..	+ 5,000	+ 6,000	+ 3,000	+ 14,000	+ 109,000	+ 0·85
S.R. ..	+ 22,000	—	− 1,000	+ 21,000	+ 34,000	+ 0·33

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Naval Review Traffic

On page 111 of this issue we describe the remarkably comprehensive arrangements made by the Southern Railway in connection with the King's Silver Jubilee Naval Review at Spithead. From personal experience and other testimony we can congratulate the Southern upon the excellence of those arrangements, the punctuality of all movements, and the smoothness of operation. Travelling by special No. 51 at 9.45 a.m. consisting of a "King Arthur" locomotive and a load of about 340 tons all told, we arrived at Southampton Dock Gates in 91 min., as against 100 min. allowed, in spite of two slight delays. On the return journey also we were before time into Waterloo. Of the 46 specials into Portsmouth and Southampton, no fewer than 40 arrived at or before time, five were from 1 to 3 min. late and one only (from Weymouth)

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was 6 min. late. The average late arrival of all the 41 trains from London was only one-fifth of a minute. On the return journey also timekeeping was, in the circumstances, good, especially into Waterloo. Four steamers were delayed by an unprecedented crush of traffic in the Solent after the illuminations, and were responsible for an average late arrival of 10 min. by their connecting trains. An automatic signal defect delayed four other trains 7 min. each on an average, but the remaining 30 specials averaged only 1 min. late arrival at Waterloo. It is also remarkable that the Southern Railway should have managed to collect 389 corridor coaches, including 66 restaurant cars, and yet run practically the whole of its main line services normally. Nor is credit all due to the operating side, for after much complicated negotiation with various tourist agencies and outside firms over the probable traffic, the tickets were not all sold as expected, and so the railway itself took over the issue of a large number. On all sides one hears nothing but praise for the arrangements generally, and we are sure that everyone who travelled by train will join us in this tribute to the Southern Railway on the enterprise and success of its arrangements.

* * * *

Overseas Railway Traffics

With the more favourable exchange of 17·02 pesos to the £, against an average of 17·44 for the corresponding week of last year, Argentine railway traffics for the past week, with the exception of the Buenos Ayres Great Southern, showed increases in sterling. Currency receipts, however, though up on the Central Argentine, Argentine North Eastern, and Entre Rios, were down on the Pacific, the Great Southern, and the Western. The Great Western of Brazil for the 28 weeks of the current year has an increase of 4,094 contos with a small increase in sterling, whereas the Leopoldina for the same period has a nominal increase of £10,616, but in currency a decrease of 608,000 milreis. In the aggregate for 27 weeks the San Paulo records an advance in currency, but is down in sterling receipts.

	No. of Week	Weekly Traffics £	Inc. or Decrease £	Aggregate Traffic £	Inc. or Decrease £
Buenos Ayres & Pacific ..	2nd	72,679	+ 1,406	142,520	+ 1,046
Buenos Ayres Great Southern ..	2nd	108,226	— 776	215,163	— 15,277
Buenos Ayres Western	2nd	43,537	+ 876	81,044	— 7,566
Central Argentine	2nd	125,129	+ 3,670	237,542	— 9,244
Canadian Pacific	27th	487,800	+ 19,400	11,793,400	— 117,200
Bombay, Baroda & Central India	15th	203,475	+ 16,725	2,367,000	+ 1,725

* * * *

The Late Mr. J. P. Scott Main

Railway servants never had a better friend; the railway companies, on matters relating to accidents to railway servants, a kinder or more broadminded critic; and the Board of Trade and, later, the Ministry of Transport, a more hard-working, loyal servant than Mr. Scott Main, whose sudden death on Sunday last, July 14, we have to announce with feelings of the deepest regret. Mr. Main was a good friend to the railway servants because of his interest and activities in the cause of their safety, wherein, from the time of his appointment in 1901, he saw, chiefly as a consequence of the working of the Railway Employment (Accidents to Railway Servants) Act, 1900, the ratio of fatal accidents to railway servants improved from 1 in 1,000 men employed to 1 in 3,000. Mr. Main's criticisms of the companies were always fair, and the recommendations reasonable. He never failed, too, to put the blame in the right quarter, and his advice as to what should be done to avoid future similar accidents was the result of a long experience of inquiries into such mishaps, and based on actual railway experience in this country and abroad. That same experience made him of much use to his colleagues, as he knew so much of the history of the Railway Department and of its relations with the railways. Mr. Main was a man who had made his subject peculiarly his own, and one cannot but regret that he has not been spared a little longer, and then to have retired with those honours that come after a life so well spent in the welfare of railway servants and of the railway companies, as well as of a Department from which he will be greatly missed.

* * * *

Left Luggage Offices

Left luggage offices are, so far as most of London's underground stations are concerned, anachronisms left over from the Victorian era. Such, at least, would seem to be the belief of the L.P.T.B. if we are to accept a recent report in the *Morning Post*. Exceptions, of course, are made of important termini and junctions, but left luggage offices form no part of new underground stations, and they have also been omitted from certain reconstructed ones. We should be bold to contradict this edict from so knowledgeable a source, for who should know more about the requirements of London than those who serve its needs? However, it may be that in this case the conclusion has been derived from too strict an adherence to the theory that, for an unessential service to be justified, its income must balance its cost. On the other hand, it may well be that, with a little stimulation, the public could be induced to cultivate the Victorian habit once again to the profit of London Transport. The board has already tried its hand, quite successfully we believe, in this matter of forming habits, for only recently it set itself the task of inducing the Londoner to travel with his feet on the floor. This was a habit inconvenient to cultivate; how much easier, therefore, would it be to instil a habit of convenience?

* * * *

Great Southern of Spain Railway

For the year 1934 the loss on working was greater than in 1933 owing to an unavoidable increase of 5 per cent. in working expenses arising largely from considerations of safety in working and from the higher cost of fuel and lubricants. Also the hoped-for increase in the iron ore traffic did not materialise. The company notified the Spanish Government on May 31 last that after June 15, 1935, the only amounts available for working expenses, including wages, must be the actual traffic receipts. Results in 1934 continued to be affected by the increased expenditure arbitrarily imposed, though the Government relief promised by the Act of 1924 has been withdrawn since the end of 1928. A surcharge of 15 per cent. on tariffs was, however authorised in May, 1934. The net result of the year's working is a debit of £20,949.

	1934 £	1933 £
Passenger receipts	13,733	14,280
Merchandise receipts	61,982	59,382
Mineral receipts	32,468	32,644
Gross receipts	111,445	109,351
Working expenses	120,140	114,166
Loss on working	8,695	4,815

* * * *

Too Much Traffic!

A year of exceptionally good crops is causing anxiety to the Great Western of Brazil Railway owing to the difficulty of handling heavier traffic with its present equipment, and the lack of funds for necessary renewals. At the meeting on Wednesday (see page 123), the Chairman reported that urgent cables for new power units, and

authority to strengthen bridges and track, had been received in London, but it had been impossible to give the assistance desired. Representations have been made to the Brazilian Government for a grant to rehabilitate the railway, so far without effect, and the company seems faced with the prospect of watching the cream of a richer traffic than has offered for some years passing into the hands of road competitors. Goods tariffs are at an uneconomic level, and passengers have been regained only by drastic fare cuts. Until road transport is controlled and co-ordinated, however, it will be impossible for the railway to make a reasonable increase in its charges. But however free from restrictions, the roads can hardly deal adequately with the freight traffic probable this year, and the Government may learn a sharper lesson than can be conveyed in interviews and speeches.

* * * *

Tail Lamps

The importance of an efficient tail lamp was brought out by the evidence of the fireman of the parcels train concerned in the Welwyn accident. He said that it was the tail lamp of the second portion that told him what was wrong; he saw the home signal at "danger" but the tail lamp revealed that there was a train just in front of him. It was also the right-hand side light of the meat train at King's Langley that gave the alarm to the fireman of the milk train—and possibly to his driver who was unfortunately killed. Five times in the year 1933 alone was the necessity for better tail lamps brought out in accident reports—a necessity, we would add, that has grown, now that side lights have been withdrawn from passenger trains. In his report on the Three Bridges collision, reviewed in our issue of August 14, 1933, the late Colonel Anderson said that, "In view of the importance of brake van lights of sufficient power . . . I am glad to learn that the Southern Company had been experimenting with one of greater power before the accident happened." We trust that progress is being made in this direction. The above experiences show that something more than a marker for the signalman to know that a train has passed complete is required; even for that a good lamp is necessary.

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Performance of the Flying Hamburger

The introduction this summer of further German express diesel-electric railcar services gives particular interest at the present time to the mileage performance of the pioneer unit, the Fliegende Hamburger or the Flying Hamburger, as it is better known in this country. Up to the end of June, 1935, it has covered a total mileage of 226,840 miles, divided over the following periods:—

Trial runs before beginning regular service on May 15, 1933	9,626 miles
May 15, 1933 to December 31, 1933	64,113 ,,
During the 12 months of 1934	100,714 ,,
January 1, 1935 to June 28, 1935	52,387 ,,

During the 25½ months in scheduled service as the fastest train in the world, booked at 77½ m.p.h. average, the Flying Hamburger has therefore covered 217,214 miles. It should be remembered that this, the first ultra-fast railcar built for the German State Railway, was put into operation as an FD train, working on weekdays only, for the use chiefly of business men. The annual scheduled working days are about 300, or 25 a month. The distance between Berlin and Hamburg is 178 miles and the above figure of 217,214 miles represents 607 round trips. The availability of the railcar in service has been 95 per cent. In the meantime 13 additional railcars have been ordered from the Wumag of Görlitz, some of which have already been supplied and others will be completed in the near future; each of these units is fitted with two Maybach diesel engines of the 410 h.p. type. In our *Diesel Railway Traction Supplement* of July 12 we illustrated the Fliegende Kölner, which on July 1 inaugurated a fast return service between Berlin and Cologne.

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Electric Headlights

In reply to the communication from "C.M.E." that appeared in our issue of July 12, we should first observe that the electric headlights used on the locomotives in America, India, South Africa and elsewhere are intended primarily to advise the driver at night of the presence on the track of horses, cattle and other larger and smaller beasts which have strayed on to the railway. No such provision is necessary for that purpose in this country, as British railways are fenced in. Proof of that may be found in the fact that the number of cases of trains running into obstructions of any kind, reported to the Ministry of Transport, is about 300 a year, including some 160 animals. From a locomotive running point of view there is the danger of the driver of a train approaching from the opposite direction being unable to see the line, signals, &c., ahead of him because of the dazzle of the oncoming searchlight. The driver who has a searchlight on his locomotive would, undoubtedly, be able more readily to see the arms of semaphore signals, but he probably would be unable to read the aspects of a colour-light signal. It is likely, too, that men working and walking on the line, particularly among moving wagons, might be dangerously blinded by the strong light of a passing train, and we can imagine a driver being unnecessarily alarmed by seeing a train in front of him which is running or standing on a parallel line. It is significant that, within the past few days, the Ministry of Transport has issued a rule, to be operative from April next, to obviate the dangers of the dazzle of motor vehicle lights.

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Locomotive Blast Pipe Tests in India

It is well established that two factors associated with locomotive operation, both of them concerned with the design and proportions of such important components as the fire grate and the blast pipe, determine in large measure the success of the engine. They influence the amount of cylinder horsepower developed, and correspondingly the train tonnage which can be dealt with by the locomotive. On the North Western Railway of India tests have been carried out with an XC 4-6-2 type engine fitted with what is known as the Kiesel blast pipe, a device successfully employed in the United States. Further particulars of this large diameter exhaust system will be found on page 118 of the present issue. A few years back some fairly exhaustive tests were made with a 4-8-2 type locomotive in America which for trial purposes was fitted with the same style of blast pipe, and it was shown that from 25 to 30 per cent. more horsepower was obtained after the device had been fitted. It was found necessary to increase the size of the grate area owing to the stronger draught secured by the alteration. The blast pipe used on the locomotive had a six-ported star-shaped exhaust nozzle with a maximum area of 53·1 sq. in., used in conjunction with a chimney diameter of 25½ in. and a grate having 14·9 per cent. air opening. The trials were carried out on the Wabash Railroad and Mr. W. A. Pownall, the Mechanical Engineer of the railway, stated that the decreased back pressure and increased temperature of superheat obtainable would mean economy of steam and decreased fuel consumption.

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The Government and Railway Works Schemes

THE Government intentions regarding the provision of the loan which is the necessary preliminary to the improvement of London's passenger transport facilities have now been revealed. As a result of the passing of the London Passenger Transport (Agreement) Bill by the House of Commons, the undertaking which is to raise the necessary funds was registered on July 10 as a public company under the title of the London Electric Transport Finance Corporation. Brief details are given on page 123. The new company has a nominal capital of £100 in £1 shares, but the borrowing powers will extend up to £40,000,000, and it is significant that of the first directors of the company—four in number—three are directors of the Bank of England and the fourth is Chief Cashier of that institution. The objects of the company are to finance the London Passenger Transport Board, the Great Western Railway and the London & North Eastern Railway or any other transport undertaking in any manner as may be approved by the Treasury from time to time and, in particular, to carry out an agreement dated June 20 between the Treasury and the Board and railway companies concerned, and to obtain from the Treasury guarantees for the due payment of principal and interest in respect of the contemplated loans. As we have already recorded, the programme of works scheduled to the Bill includes the electrification of part of the suburban lines of the L.N.E.R. and G.W.R., the construction of 12 miles of new tubes, the substitution of trolleybuses for trams in various parts of London and the improvement of the power supplies of the London Passenger Transport Board. A further schedule divides the borrowings under the Bill in the proportions of L.P.T.B. 70 per cent., L.N.E.R. 25 per cent., and G.W.R. 5 per cent.

The agreement also provides that when certain new statutory powers have been obtained, the works must be completed as quickly as possible, but in any case within a period of five years from September, 1935, or such other period as the Minister of Transport may allow. The determination of the time when the money is to be raised by the new company is to be in the hands of the Treasury, but on Wednesday last an issue of £32,000,000 of 2½ per cent. guaranteed debenture stock was made at £97 per cent., the stock being redeemable at par in 1950-1955. This money will be lent to the transport interests as and when necessary at the same rate as that at which it was raised. It will now be possible for the interests concerned to proceed with these important improvements. Although they are concerned with passenger transport in London, they will be of national importance in that a great deal of the employment which the schemes will afford will be in areas outside London. As far as practicable, all plant, machinery and material required for the works must be of United Kingdom origin, while all manufactured articles must be wholly manufactured within the United Kingdom. Moreover, in connection with the supply of such articles, preference must be given, other things being equal, to firms whose works are situated in distressed areas. It is quite impossible to forecast the extent to which employment will be increased in these areas, but the Government is naturally concerned that, wherever possible, the work shall be carried out in those districts where work is most urgently needed.

Thus the Government, by the use of its high credit status, in guaranteeing the loan, has enabled these transport undertakings to raise the necessary funds upon terms which justify them proceeding with these important schemes. At the same time, the works will increase employment, and consequently spending power, over a wide area for five years, benefit certain basic industries, and provide a valuable stimulus to industry. Having regard to all these considerations, we make no apology for reiterating that the same principle might usefully be adopted in connection with other works schemes of major importance which the railway companies have found it necessary to postpone owing to their inability to raise the essential capital unaided at a rate which would enable them to earn an economic return.

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Electrification of Passenger Traffic

IN our issues of March 29 and April 5 (*Electric Railway Traction Supplement*) we commented upon an article which Sir Herbert Walker contributed to a *Financial News* Supplement entitled "Electricity." Sir Herbert Walker's subject was railway electrification, and in the same supplement there was another article by Sir Arnold Gridley, entitled "Electricity Supply in Great Britain." Where the latter article referred to the subject of railway electrification it was curiously contradictory to much that Sir Herbert Walker said. Sir Arnold Gridley referred to "the almost complete lack of enterprise in recent years of the great railway undertakings in the matter of further electrification of their systems." Referring to the heavy loss of traffic by the railways to the roads, he remarked: "That traffic can be regained by electrification cannot be disputed." While this is undoubtedly true in nearly every case, because of the improved services provided when existing steam trains are replaced by new, more frequent, and usually faster electric services, it should not be forgotten that the gain is confined almost solely to passenger traffic, which represents only some 40 per cent. of the total income of most lines.

Sir Herbert Walker, with the authority of practical experience behind him—an experience which has not been gained by an "almost complete lack of enterprise"—stated in his article that "the electrified portions of the Southern Railway cost more to operate than they did under steam conditions." Whenever a scheme of electrification is considered from the point of view of increasing net revenue this must be remembered. The increase in revenue must more than offset the increased gross cost of working and the additional capital charges. Southern Railway electrifications have been outstandingly successful, but Sir Herbert Walker himself has stated (a little modestly, perhaps) that conditions were eminently suited to electrical operation. Although the gross operating costs go up, the expenditure per train-mile goes down, and, as may be inferred from the article on British railway passenger traffic statistics published elsewhere in this issue, electrification is a decided advantage to the operating officer, in addition to the traveller, for it can give an intense yet flexible service with a minimum of shunting and light stock movement, and thus with a maximum of operating efficiency. The propensities of electrification in this respect can be compared in some degree by an examination of the tables in the above-mentioned article, remembering always that some advantage accrues to the Southern Railway by reason of the concentrated nature of much of its passenger traffic.

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Bombay, Baroda & Central India Railway

A SUBSTANTIAL improvement in gross earnings for the year ended March 31, 1935, was more than offset by an increase in expenditure. The gain in gross receipts was principally in goods traffic on the metre gauge, though increases were shown both in coaching and goods traffic

on both gauges. The combined system, apart from the 703½ miles worked for Indian States and other companies, now consists of 1,035¼ miles broad gauge, 1,881¼ miles metre gauge, and 72¼ miles 2 ft. 6 in. gauge worked by the company for the Government of India. The Palanpur Deesa Railway of 17 miles on the metre gauge which was a year ago included in the combined system now appears among the lines worked for Indian States or other companies, but there has been no addition to the total mileage operated. It is understood that the Jaipur State intends to take over from B.B. & C.I. Company as from April 1, 1936, the working of its 181 miles of railway. Gross receipts of the combined system for the year under review increased by Rs. 36,70,635 to Rs. 11,07,64,956, but in the expenditure of Rs. 6,41,30,601 there was an increase of Rs. 53,17,793, so that the net earnings of Rs. 4,66,34,355 showed a decrease of Rs. 16,47,158 in comparison with 1933-34. The company's share of surplus profits, after deducting Indian income tax and super tax, is Rs. 6,26,208, compared with Rs. 6,65,348 for the previous year and has produced £47,147 in sterling, as against £49,849. Stockholders receive 6 per cent. (including 3 per cent. guaranteed interest) for the year under review, the same as for the last fourteen years. Some operating results for the combined system are compared in the accompanying table:—

	1934-35	1933-34
Passengers, number	54,124,220	53,896,486
Passenger receipts, Rs.	3,39,21,202	3,34,96,551
Tons carried	8,489,143	7,965,660
Average ton-mile receipt, pies ..	8	8·21
Goods receipts, Rs.	6,58,87,586	6,31,48,612
Gross train-mile earnings, Rs. ..	7·22	6·99
Net train-mile earnings, Rs. ..	3·04	3·15
Train-miles	15,338,496	15,308,175
Operating ratio, per cent.	57·90	54·92

Coaching receipts on the combined system showed an increase of Rs. 8,23,198, improved earnings being shown under each heading except first class, although there was a slight increase in first class numbers and a decrease in second class numbers. General merchandise receipts improved by Rs. 24,83,641, the principal increases being in cotton, food grains (other than wheat), and provisions. Maintenance of structural works cost on the whole Rs. 18,91,102 more; there was an increase of Rs. 15,28,686 on maintenance and supply of locomotive power; and maintenance of carriage and wagon stock cost Rs. 20,81,239 more.

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Northern Railway of France

THE general industrial depression and unrestricted competition of road and water transport continued in 1934 to affect adversely the 3,830 km. of this company's lines in France. Similar conditions and a reduction in transit traffic also affected the earnings of the Nord-Belge Company—controlled by the Nord—which has lines 170 km. in length serving Liége, Namur, Dinant, and Charleroi. Gross receipts on the French system in 1934 were lower, but the saving in working expenses exceeded by fr. 105,893,723 the reduction in earnings. On the working of the two Ceinture lines of Paris, the company had to bear a loss of fr. 3,949,529 in 1934 compared with fr. 5,128,299 in 1933. The result of the year's operations on the Nord system in France has been that after meeting all outgoings, including capital charges of fr. 570,781,754, there is a deficit requiring a claim of fr. 518,521,712 from the Common Fund, comparing with fr. 608,717,848 in 1933. The dividend for 1934 is fr. 85 on each fr. 400 ordinary share, the same as in 1933 and 1932. The working of the Nord-Belge lines in 1934 resulted in a deficit of 9,785,601 Belgian francs, compared with 21,710,927 in 1933. No decision has yet been given on the company's appeal against the judgment of the Belgian Court of first instance that the Namur-Liége concession expires in 1941 and not in 1953.

In passenger numbers in 1934 there was an overall decline of 1·8 per cent., though in Anglo-French traffic there was an increase of 3·7 per cent. Traffic with Belgium and beyond, however, showed a diminution of 10·2 per cent., chiefly due to a smaller number of Belgian workmen coming to work in Northern France. Railcars have already done something to arrest the fall in first and second class traffic between Paris and Lille. But for the modification of the passenger transport tax, passenger receipts in 1934 would have shown a decrease instead of an increase of fr. 23,060,755. First class passengers in 1934 brought in 7·68 per cent. and second class passengers 22·76 per cent. of the total passenger receipts. The traffic in *colis express* has continued to show a gratifying increase, but *grande vitesse* receipts as a whole were down and in *petite vitesse* tonnage there was a fall of 5 per cent. On the operating side real economies and improvements in efficiency have continued to be effected, and the staff has responded favourably to the newly instituted *boîte à idées* (suggestions scheme). The slight net increase in train-kilometres is due to additional railcar services. Figures in the accompanying table refer to operations in France.

	1934	1933
Total train-kilometres	54,662,737	54,457,837
Operating ratio, per cent.	94·09	100·20
Passengers	127,251,987	129,614,752
Petite vitesse, tons	48,158,653	50,707,303
	Francs	Francs
Passenger receipts	407,182,189	384,121,434
Goods and express parcels, G.V. ..	148,485,570	159,817,085
Goods, P.V.	1,101,746,354	1,228,139,653
Gross receipts	1,728,781,358	1,847,328,123
Working expenses	1,626,577,832	1,851,018,321
Net receipts	102,203,526	Dr. 3,690,198

From the net receipts for 1934 has to be deducted the sum of fr. 4,462,785, representing the ⅓ share payable to the State Railways out of the net earnings of the Amiens-Rouen line.

* * * *

Wear of Rails

SOME facts of interest concerning the wear of rails were detailed in an address given recently by Mr. J. M. Ashworth, Chief Engineer of Way and Works of the Victorian Railways of Australia, to the Metallurgical Society of Melbourne University. On his system every possible extreme of rail wear is experienced, from that caused by the destructive effect of a dense electric train service in the Melbourne area to the almost imperceptible wear in up-country districts, where rails have an indefinite life. Over 51 per cent. of the Victorian lines the weight of rolling stock carried averages less than 1,000 tons a day; over 70 per cent. it is less than 3,000 tons a day; and over 94 per cent. less than 10,000 tons a day. On tracks in the first of these three categories, 60 lb. per yd. flat-bottomed rails have been in use for 55 years, have suffered practically no loss of weight, and none have been renewed. On lines carrying 3,000 to 5,000 tons daily, 75 lb. and 80 lb. rails that have been in service for 37 to 52 years continuously show top wear varying from 1/16 to ⅛ in. From wear measurements made on the Victorian system, it is calculated that, based on a maximum permissible wear, for 60 lb. rails, of ¼ in., the rails in a track carrying 1,000 tons of traffic daily should have a total life of 400 years. In the case of 80 lb. rails, permitted to wear down to a total extent of ⅜ in., a traffic of 5,000 tons daily would necessitate replacement in 120 years, and 10,000 tons daily replacement in 60 years. Based on a permissible wear of ½ in., the life would be reduced to

XUM

40 years if the track carried 20,000 tons daily, and 26½ years for 30,000 tons daily. Broadly, it is estimated that in straight tracks, rails of ordinary quality may be expected to wear down ⅛ in. under 60 million tons of traffic, and to carry from 100 to 200 million tons of traffic before replacement is required.

There are other factors, however, which rapidly increase the rate of wear. On a 15-chain curve, laid with 60 lb. rails, the life is reduced to 72 years, as compared with the estimated figure of 400 years on straight track when the traffic does not exceed 1,000 tons daily. In the Melbourne electrified suburban area the wear on curves has been greatly reduced by rail lubrication, using a special preparation of grease containing about 15 per cent. of graphite. Another factor, one to which Mr. Ashworth did not refer in his address, and which is, probably, of but minor importance in the climatic conditions of Australia, is corrosion. Rail longevity of the kind to which reference has been made would be impossible in Great Britain owing to the constant alterations of damp and dry conditions, which ultimately weaken the whole rail section, as well as accelerating the head wear. Rails rolled in earlier years, with high percentages of phosphorus and sulphur, which benefited from the toughening effect of work hardening in the first decade or so of their life, when traffic conditions were relatively light, have lasted from 40 to over 50 years in Great Britain, but this has been the exception rather than the rule. Yet another factor which must be taken into account, especially where the standard of track maintenance is not of the highest, is fatigue. Constant increases are taking place in the weight and speed of the moving loads, and unless the weight of rail sections is increased, it is doubtful if the standards of permissible wear—reaching a maximum of ½ in., which is equivalent to the reduction to 80 lb. per yd. of a 95 lb. bull-head rail section—can any longer be maintained with safety, especially when the possible effects of corrosion on the web and underside of the rail are taken into account. During recent years the composition and physical properties of steels which make for improved rail wear have come more prominently under review, and a movement is at length beginning in Great Britain towards the use of a revised 100 lb. bull-head section—exactly the same in the profile of the web and foot as the revised 95 lb. section, but with 3/16 in. more metal on the top of the head—to allow increased head wear before renewal is necessary. Corresponding attention now needs to be directed to the degree of wear which is still safely permissible in the increasingly onerous conditions of modern service.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A Contribution to Peace

390, Wakefield Road,
Huddersfield, July 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was amused to read your philosophical reflections after a meal in an L.M.S.R. dining car, but was surprised at your omission to refer to the extraordinary "motto" from Homer which has lately been exhibited on the L.M.S. menu cards. It reads:—

"There is good hope that thou mayest see thy friends."

I first encountered this on the Mancunian shortly after that train had been experiencing an epidemic of broken couplings when en route, and it seemed to be singularly ill-chosen.

A similarly disquieting legend is (or used to be) visible near Stratford (L.N.E.R.), where, when the train is clattering over points and crossings, a hoarding erected by a religious body exhorts one to "Prepare to meet thy God."

Yours faithfully,

W. A. TUPLIN

Railcars

4, Limerick Road, Redland,
Bristol, 6, July 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—During June I had occasion to make a number of journeys more or less at random on the railcars which form so conspicuous a part of the train operation on the L.N.E.R. (North Eastern Area). In accordance with my practice I made accurate records of the running and was rather surprised to find that there was a considerable loss of time on the scheduled station to station times.

Altogether on seven journeys 14 min. were lost "by engine." On one journey of 12 miles no fewer than 6 min. were lost, whilst on only one trip were the scheduled running times actually adhered to throughout.

In view of the well known efficiency of the intensive train operating in this area, for which I have always had the greatest admiration, I should be interested if any reader could confirm similar experiences or suggest a reason for the loss of time indicated. All the trips were made in different cars, and as far as I am aware under normal operating conditions.

C. R. CLINKER

Would it Pay to Abolish First Class?

London, S.W.1,
July 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your correspondent's article in this week's issue on the pros and cons for the abolition of first class is very interesting, but, talking it over with friends, we think he is very much out in one calculation. He says that if first class were abolished "let us assume that 10 per cent. of the traffic would be diverted to the road."

All my friends, both in business and on pleasure, always travel first class, and we think that a diversion of 33⅓ per cent. would be more likely. Probably nine first class travellers out of ten (or a greater proportion) have their own motor cars, and if what their accustomed amenities in rail travel had been were abolished, they would in large numbers take to their cars. Increasingly in the next few years there would be loss to the air, and the abolition of first class might mean a total loss of approaching 50 per cent. in the next five years.

The point your correspondent makes about the demand for improvement in the (remaining) third class stock is a very real one. The tendency in the comfort of travel is upwards, not downwards, and the demand would be to bring up the level of the third class to (what had been shown to be possible in) that of the abolished first class.

Yours faithfully,

FIRST CLASS

[Our correspondent appears to assume that the abolition of first class accommodation would result in the disappearance of all the "accustomed amenities" of the class. Experience in the United States shows that, at any rate on the chief main line trains, there is a definite and paying demand for Pullman and other special facilities for which increased tariffs are charged. The writer of the article bore this in mind in arriving at his figure of 10 per cent., and stated in a subsequent paragraph that "there would also be a demand for some kind of reserved accommodation. . . ." The implication is that such special facilities would keep the first class traffic loss down to 10 per cent.; and that the charge made would cover the cost of providing such accommodation and so not invalidate the general calculations.—ED. *R.G.*]

PUBLICATIONS RECEIVED

Rambles in Durham and Northumberland. York: London & North Eastern Railway. 7¼ in. × 4¾ in., 109 pp. Illustrated. Folding map. Price 6d. net.—This is another of the very pleasing little booklets that the railways have recently been publishing for the guidance of the rambler. "Rambling in Northumbria is indeed a fascinating pastime. He who believes that this ancient kingdom has been converted into a grimy industrial wilderness cannot do better than go and discover the land for himself. A joyous awakening awaits him." Such is the encouragement given in the introduction to set out on one of the 21 suggested routes, the descriptive text of each of which is accompanied by a sketch map. In addition, here and there attractive black-and-white sketches are interspersed to give some idea of the type of scenery and places of interest that are to be encountered in Durham and Northumberland.

West Highland Steamers. By C. L. D. Duckworth and G. E. Langmuir. London: Richard Tilling, 105, Great Dover Street, S.E.1. 7½ in. × 4¾ in. × 1 in. 239 pp. Illustrated. Price 6s. 0d. net. Also obtainable from this office, price 6s. 5d., post paid.—No one can travel far in the West Highlands without becoming acquainted with the steamers of David MacBrayne (1928) Limited, a railway associated company, and often enough the acquaintance is only the prelude to a lasting enthusiasm. The authors of this book are enthusiasts, and they have set themselves out to write for their fellow-enthusiasts. Although, as the preface points out, "a volume of this nature involves little or no creative work; it is merely the concentration in convenient form of a mass of information and data," Messrs. Duckworth and Langmuir seem to know how to do their massing in an easy "chatty" style. In some cases the information might be a little more convincing with fewer "we believe" qualifications.

While age gives foundation for much of the ship-lovers' sentimental musings about the MacBrayne fleet—the *Iona III* built in 1864 is still in service, there is yet the joy to be derived from sailing the Scottish lochs and coastal waters in such a modern ship as the T.S.M.V. *Lochfyne*, acknowledged to be the latest thing in marine design. The authors in their survey do justice to both the past and present, and deal equally carefully with every one of the 95 ships which have, since 1851, graced the MacBrayne fleet, then owned by David Hutcheson & Co., from whom it was purchased by David MacBrayne in 1879. The story makes a fine narrative, for MacBrayne's boats, which, incidentally, have never left port on the Sabbath, have helped in no small way to shape the modern economic development of Scotland. It is to the presence of the famous red and black funnelled fleet that Oban, for instance, owes its reputation for being the Charing Cross of the Highlands.

The illustrations are profuse, and a coloured plate of the *Columba*, built in 1878 and still in service, makes a pleasing frontispiece. At the end of the book a number of blank pages have been left for the reader to add his own future notes. A table is also included summarising the principal facts and figures of each of the vessels described in the body of the book.

Trinakria: Van Reizen en Trekken or Sicilië. (Journeys and Jaunts in Sicily). By S. A. Reitsma, Editor-in-Chief of *Spoor- en Tramwegen*. Reprinted from No. 9 of that journal, April 23, 1935. The Hague: Moorman's Periodieke Pers N.V. 5½ in. × 8½ in. 20 pp. No price stated.—"Trinakria" was the name given, from its roughly triangular shape, to the island of Sicily by the ancients. In these twenty too brief pages Mr. Reitsma gives us a charming account of the beauties of Sicily, both as regards scenery and the many points of historical interest to be found in her towns and monuments, the remains of numerous and profound changes spread over a great space of time. Happily the journey there and back from the mainland can now be accomplished in comfort, in marked contrast to the experience of Goethe in the year 1787, who, to avoid the brigands then infesting Southern Italy, set sail from Naples and took about five days to reach Palermo. Mr. Reitsma takes us to all the beauty spots and places of interest in art, history and science, accompanying the description of his travels with much instructive detail. Taormina, often called the earthly paradise, so charmed him that he could not resist placing some coin in the Grecian vase which ornamented the waiting room of the little station, in imitation of the pilgrims to Rome, who cast an offering into the Trevi Fountains, to ensure a speedy return to the Eternal City.

A Harco Jubilee.—To mark the Diamond Jubilee of the firm's activities, G. A. Harvey & Co. (London) Ltd., of Greenwich, has produced a 640-page catalogue printed on heavy art paper and bound in a strong and serviceable blue cloth binding. The scope and comprehensiveness of the contents render this a most useful reference book for those concerned with the various applications of metals in modern industry. The fifteen-page index alone can give any real indication of the diversity of the products listed, which range from perforated zinc sheeting to large water softening tanks. The compilers have taken care to avoid confusion, and the different products have been arranged and classified according to the description of the materials and method of manufacture. The main divisions are headed sheet metal work, zinc and copper work, perforated metals, woven wire, wirework, steel equipment for offices and works, cast goods, miscellaneous, and steel plate work. Whenever possible, prices are given, and throughout there is a wealth of illustrations.

Spray Guns.—B.E.N. Patents Limited, of Park Royal, London, has marketed a new fast-spraying gun, known as model R.F., which is the subject of a recently issued leaflet. A special feature of the gun is that by the rotation of the spreader cap a round or fan shaped spray can be arranged. The gun is designed to apply all the usual finishing materials, and it also particularly suitable for dealing with new synthetic finishes and aeroplane dopes.

Lead-Acid Batteries.—Electric batteries used for haulage work have to submit to arduous service which makes certain refinements of construction essential. An illustrated catalogue issued by Britannia Batteries Limited, Union Street, Redditch, outlines several special features of the Britannia tubular lead-acid batteries which will be appreciated by all who use such equipment. The positive plates are multi-tubular, double ribbed for strength, and slitted horizontally to allow the electrolyte ample access to the active material inside the tubes, so minimising the shedding of paste. The negative plates, also, are unusually long-lived owing to the use of a special active material moulded with a ribbed surface affording unimpeded acid circulation. The batteries are made in two types, with capacities from 93 to 402 ampere-hours at a 5-hr. rate of discharge, for electric vehicles and locomotives, or from 72 to 715 ampere-hours at a 100-hr. rate for marine work.

Iron and Steel.—A new general catalogue, neatly bound in imitation black leather and covering the whole range of the firm's products, has recently been issued by the Barrow Hæmatite Steel Co. Ltd. Special attention is given to steel rails, and particulars are provided of the production of all the British Standard sections, both flat-bottomed and bull-head rails, old or revised sections, and also the current A.S.C.E. sections. Together with this catalogue comes a special booklet, attractively produced, setting forth the advantages of the company's S.P. (semi-phosphoric) foundry pig iron. Specially stressed are its advantages in the production of high-grade castings, particularly those which must be free from porosity. A large number of different grades in this brand are available in which the phosphorus content varies from 0·15 to 0·40 per cent., the silicon from 1·5 to 4·5 per cent., and the manganese from 0·75 to 1·5 per cent. The sulphur content is remarkably low and rarely exceeds 0·035 per cent. Castings made from these low phosphorus irons are particularly suitable for severe conditions involving high pressure and unusual wear and tear.

XUM

THE SCRAP HEAP

Teacher—" Now, can any boy give me a sentence using the word ' diadem '?"

Pupil—" People who drive carelessly across railway tracks diadem sight quicker than those who stop, look, and listen."

* * *

An engine on the " condemned " list sustained a fractured axle on the way to the works yards, causing a slight dislocation of traffic to and from the works. A waggish individual in the erecting shop, on hearing what had happened, remarked that the engine had " broken down on the way to be broken up," whilst another thought that possibly it felt a bit cut up at the prospect of impending dissolution.

* * *

" Make me a child again, just for to-night."
Once said a Scotsman—and Scotsmen are tight.
" I'm leaving tonight on a rail trip to Ayr;
Make me a child and I'll travel half-fare."—*From the " Canadian National Railways Magazine."*

* * *

The following is from *Pennyfare*, the staff magazine of the London Passenger Transport Board:—

A small German boy at school in England was being taught English by phonetics. He was told to spell " fish," and wrote " ghoti." This seemed rather unreasonable, until his teacher heard his explanation:—

gh, as in " enough " .. f
o, as in " women " .. i
ti, as in " station " .. sh.

* * *

JAPANESE AMAZONS WORK TOO HARD

The town of Tsuchisaki, situated in the Prefecture of Akita, where Japan's hardiest soldiers are recruited, employed four women baggage rustlers. However, railway officials were receiving so many complaints that the girls were excessively rugged in handling passengers' baggage that they had to caution them.—*United Press.*

* * *

The Liverpool & Manchester Railway locomotive-carriages are of three kinds, and are called train, luggage, and bank engines. The train-engines average about 30 horses' power; they weigh about 8 tons, and cost about £900. The luggage-engines are in general, 35 horses' power, and weigh about 9 tons; they cost about £1,000. There are only two bank-engines, the *Goliath* and *Samson*, which are used for assisting the trains up the inclined planes at Whiston and Sutton; they are about 50 horses' power, weigh about 12 tons and cost about £1,100. The company has had altogether 32 locomotive-carriages made . . . The *Vulcan*, a train engine, ran no less than 47,000 miles before it required to be repaired; and the *Firefly* ran 50,000 miles. The greatest speed which the engines have been able to obtain on a level is 60 miles per hour, without a load.—*The " Mechanics' Magazine " of July 4, 1835, quoting from a paper read by Mr. David Stevenson to the Scottish Society of Arts.*

* * *

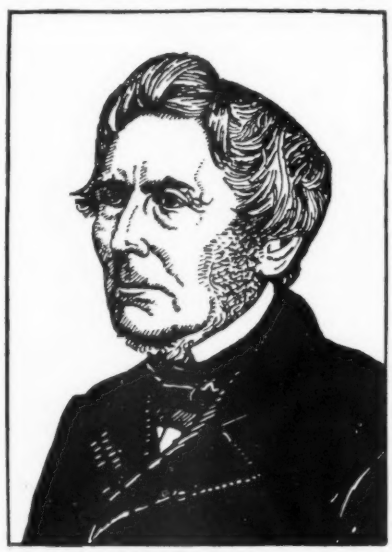
A RAILWAY PIONEER IN GERMANY

The introduction of railways into Germany is associated inseparably with the names of two men, Friedrich Harkort and Friedrich List, who, though not the first to advocate the idea of traction on smooth rails in that country, were certainly the first to make serious attempts to interest the public in the new means of transport. A Bavarian, Ritter Joseph von Baader, had pointed out as early as 1814 that a railway between Nuremberg and Fürth, where indeed the first line in what is now Germany was actually constructed, would meet a long felt want. Baader, however, took no further steps in the matter then, but he lived to see the line in question opened.

Friedrich Wilhelm Harkort was born in 1793 near Hagen, Westphalia, where his family possessed estates. It was a district where iron had been worked for some time and Harkort's father was engaged in that business. After 1815, the son turned his attention to it too, and established a foundry and workshop, persuaded that what was being done in England with the help of stationary steam engines could be done in Westphalia if the people bestirred themselves. In March, 1825, the year in which the Stockton and Darlington line was opened, there appeared in the Westphalian journal *Hermann* an article from Harkort's pen entitled " Railways," pointing out what was being attempted and accomplished in England and emphasising with the aid of comparative figures, the material advantages which Prussia would derive from the introduction of the new system of locomotion.

The importance of the question for the iron districts around the Ruhr was especially dwelt upon. One outcome of the Congress of Vienna had been that the Netherlands controlled the mouths of the Rhine and were able to influence German export trade adversely by levying tolls on goods passing. Harkort advocated the linking of the Ruhr with the ports of Bremen and Hamburg by rail as a means of turning this difficulty. His article attracted attention in some circles, but nothing practical resulted. The journal *Hermann*, indeed, complained that it was the great failing of the Germans to do nothing with new ideas or inventions until their neighbours had gone ahead with them and reaped the benefits.

Harkort's activities were not limited to writing. He made a piece of railway track of a novel form, but it did not compare well with the ordinary flanged wheel system and came to nothing. The principal objections to the establishment of railways seem to have come from official circles, for the Prussian authorities rejected all proposals to that end with the assertion that there was already an excellent system of high roads and no demand for faster travelling facilities! Harkort continued to agitate nowithstanding, and sought to impress upon the King of Prussia that certain railway routes, which he outlined, would enable " foreign " territories, such as Hanover and Hesse, to be avoided by freight



Friedrich Harkort

in transit, a thing impossible with river transport, which shows how great were the hindrances to internal trade at that time caused by the political disunity reigning in Germany.

The news of the locomotive competition at Rainhill in 1829 gave renewed encouragement to Harkort and the few who thought with him, but officialdom remained unsympathetic. In 1833 he issued a pamphlet entitled " The Minden to Cologne Railway," in which, among other things, he dwelt upon the importance of the iron way to the efficient defence of Prussian territory. In 1835, after ten years of fruitless effort to make Westphalia the scene of the first German line, Harkort ceased his propaganda under the pressure of business cares, complaining that he had done all he could, and that had energy been shown Prussia would already be enjoying great benefits. " A curse on our impenetrable German sleepy-headedness," he exclaimed bitterly. Harkort died near Dortmund in 1880, aged 87, living to see railways widely spread in Germany, but being himself directly associated with none.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

NEW ZEALAND

North Island District and Headquarters Reorganisation

For reasons of economy and efficiency the Railways Board has decided to abolish the Ohakune District, the work of which will be distributed between the Wellington, Auckland and Wanganui Districts. At the same time, with a view to present and future requirements there has also been a strengthening of the personnel on the head office administration side, including the appointment of a Transportation Superintendent.

Successful Financial Year

Preliminary figures for the financial year ended March 31, 1935, show increases in revenue of £295,162, and in expenditure of £293,452, as compared with the previous year, leaving an increase in net revenue of £1,710. The expenditure figures include the cost of the 5 per cent. restoration of salaries and wages, which amounted to approximately £150,000, and also the rent readjustment which was made in favour of the staff amounting to approximately £30,000. There had moreover, been an additional £100,000 put into the maintenance of railway property, largely to provide a still higher standard of facilities and service. A gratifying feature was the increase which had been maintained in the gross revenue. Last year had shown an increase of £298,308 over the previous year, and, with the year just closed showing an increase of £295,162, there was an increase in the gross revenue for the two years of nearly £600,000. The estimated revenue for the purpose of the Budget was £6,356,970 and this had been exceeded by £270,903.

New Tawa Flat Line Construction

Reference was made in these columns last week to developments in the electric welding of rails on the N.Z. Railways. At the invitation of the Railways Department, the Governor-General, Lord Galway, and Lady Galway, visited Tawa Flat on May 16 to witness the welding of the last joint for the first set of permanent rails on the deviation. Their Excellencies displayed much interest in the process and explanation, and on its completion expressed their thanks both to the officers of the Department and to the workmen who actually did the welding. The Viceregal party made the journey by railcar and before returning Lord and Lady Galway were greatly interested in the method by which the car was reversed. The attendant, by means of a lever, lowered from beneath the chassis a permanently-fitted jacking device which rests on the rails and enables the wheels of the car to be lifted clear of the track, the car then being revolved on a turntable fitted to the jacking device. The turning movement is so well balanced that although the car weighs 4½ tons one operator can easily turn it: a reversal of the jacking process replaces the car on the rails. This car is shown being turned in the illustration on page 120.

The Department hopes to have this new and comparatively easily graded deviation out of Wellington in use for goods traffic by the end of July. Certain difficulties at present experienced in working the new marshalling yards from the old lines will then be obviated.

ARGENTINA

Silver Jubilee Dinner

To celebrate the Silver Jubilee of H.M. King George V, the members of the Centre of British Engineering and Transport Institutions held a dinner in the restaurant of the B.A.G.S.R. Plaza Constitución Terminus, Buenos Aires, on May 31. Mr. John Wilson, O.B.E. (Traffic Manager, B.A.G.S. and B.A.W. Railways) presided over the gathering, which numbered about 220. The British Ambassador (Sir Henry G. Chilton, G.C.M.G.), who was unavoidably absent, was represented by Mr. Stanley Irving, C.M.G. (Commercial Counsellor to the Embassy), and amongst those present was Sir José Evaristo Uriburu, G.B.E. (late Argentine Ambassador to Great Britain). The Chairman announced that the following message had been sent to, and reply received, from His Majesty:—

H.M. THE KING,
Buckingham Palace, London.

The 800 members of the following institutions, the Institution of Civil Engineers, Institution of Mechanical Engineers, Institution of Electrical Engineers, Institution of Locomotive Engineers, Association of British Engineers, Institution of Railway Signal Engineers and Institute of Transport, resident in the Argentine and neighbouring republics, through their central committee, respectfully beg to tender to Your Majesty their sincere and loyal congratulations on the memorable occasion of your Silver Jubilee.

WILSON, Chairman.

(Reply)
British Embassy,
Buenos Aires.
May 7, 1935.

DEAR MR. WILSON,—I have received a telegram from the King's Private Secretary requesting me to convey to you and the 800 members of the various engineering institutions, His Majesty's sincere thanks for the telegram of good wishes you sent him on the occasion of the celebration of the twenty-fifth anniversary of his accession to the throne.

Yours sincerely,
(Signed) H. G. CHILTON.

After the customary toasts of "The President of the Argentine Nation" and "The King" had been honoured, Mr. Irving proposed that of "The Centre of British Engineering and Transport Institutions," which was replied to by Mr. M. F. Ryan, C.B.E. (General Manager, B.A. & P. Railway). The toast of "The Guests," proposed by Mr. Ronald Leslie (General Manager, Central Argentine Railway), was responded to by Sir José Evaristo Uriburu, who said that he considered himself one of the members of the Institution of Engineers, as he was an Honorary Fellow of the North-East Coast Institution of Engineers and Shipbuilders, an institution which since its foundation over half a century ago, had done inestimable work in co-ordinating the activities of, and collecting information for the world-renowned industries situated on the banks of the Tyne and in its vicinity. He also mentioned that, amongst the public duties which he had performed while in London, was the unveiling of a memorial to George Stephenson, presented by Argentine railwaymen; a visible tribute paid by the Argentine Society of Inventors to the memory of that famous mechanical engineer and inventor. That memorial, designed by an Argentine sculptor and cast in an Argentine foundry, placed in the hall of a society of which Stephenson was the first president, testified to the admiration and respect felt by the donors for the man of genius whose locomotive steam-engine so completely changed life on this planet. That Argentines should revere Stephenson's memory was but natural, for until railways began to be constructed in Argentina, in 1857, they depended for means of locomotion on horses and mules and ox-drawn carts.

CHILE

Increased Wages on State Railways

A decree authorising the scale of salaries and wages of the personnel of the State Railways to be raised, has been signed by the President of the Republic. The increase involves an additional disbursement of 13,000,000 pesos (approx. £137,189) per annum, of which 10,000,000 pesos represents payment to workers on a daily wage, and the remainder to salaried employees.

Antofagasta-Salta Railway

The ceremony of laying the first rail of the above international line referred to in THE RAILWAY GAZETTE of April 24 last, was performed in Augusta Victoria, on June 8, by the Minister of Production (Señor Matias Silva) and Señor Osvaldo Vidal (Minister of Education). Rails and sleepers to the value of 1,000,000 Chilean pesos have been collected in readiness to start rail-laying over a distance of about 50 of the 84 miles between Augusta Victoria and Socompa on the Chilean-Argentine frontier, where it is intended to join up with the Argentine section, from San Antonio de los

XUM

Cobres—a distance of 198 miles—work on which has been suspended since the beginning of 1931. According to information from Santiago, the Chilean Government has voted 1,000,000 pesos (approximately £10,553 sterling) towards the construction of the Chilean section.

Materials for the State Railways

Proposals submitted to the Government by the Director-General of the State Railways to purchase rails to the value of 10,000,000 pesos (approx. £105,530) have, it seems, been favourably reported on by the Ministry of Production. It is also stated that the Ministry of Production has allocated the sum of 4,000,000 pesos (approx. £42,212) for the renewal of the entire rolling stock of the railway from Puente Alto to El Volcan.

VICTORIA

Nine Months' Railway Revenue

The Government Railways' revenue for the month of March, 1935, compared with the same month of the previous year, was: March, 1934, £824,036; March, 1935, £822,646. Also the aggregate traffic revenue for the three quarters, from July 1, 1934, to March 31, 1935, compared with the same period in the previous year was: 1934, £6,986,180; 1935, £7,163,244.

SPAIN

Conversion to Broad (5 ft. 6 in.) Gauge of Silla-Cullera Line

By the recent conversion of the Silla-Cullera section of the Northern Railway the Ribera district is now brought within a 50-min. run of Valencia, without the former delay and change of trains at Silla. The section converted is 26 km. in length and its opening as a broad gauge line was inaugurated in the presence of the Marques de Alonso Martinez, Chairman of the Northern Company and a distinguished gathering of guests and officials. The line was originally a privately-owned metre gauge railway but was purchased some years ago by the Northern Railway.

Madrid Metro.

The Madrid Underground Railway Company (Compañia del Metropolitano de Madrid) has submitted to the Minister of Public Works, through its Manager and Chief Engineer, Señor Miguel Otamendi, plans for the extension of the present Sol-Embajadores line to Arguelles, with the prospect of a later extension to the University City. The new extension follows a line drawn from the Puerta del Sol to the Plaza Callao, where there will be a station, and thence via Plaza de España to Arguelles, which will be the terminus at present. This new line to Arguelles will have a length of 2·036 km. and four stations, all these being near street level and therefore easily accessible. The estimated cost is in the neighbourhood of twelve millions of pesetas, and it is calculated that the construction will take about two years to complete. When this line is finished, Madrid will have a new means of communication between North and South, and with the rapidly growing districts beyond Las Delicias and round the new Municipal Markets and abattoirs.

JAPAN

Details of Shimonoseki Straits Tunnel

At a meeting of high officials of the Ministry of Railways on May 16, final plans for the design and construction of the Shimonoseki Straits tunnel were adopted. A single steel and concrete tube, 7·6 m. (25 ft.) in diameter, will be used, the top of it being some 20 ft. below the bottom of the straits, or 120 ft. below sea level at high tide. The under-water length of tunnel will be about 1,600 m., or roughly a mile, but the total length will be about 2,900 m., or over 1¾ miles.

SIAM

Royal State Railways in 1934

A Report on *Economic Conditions in Siam*, 1934, just published by the Department of Overseas Trade, says that no new lines were opened for traffic during the year, but the 1934-35 programme includes the completion of the formation of the North-Eastern line extension to Nongkai. This line was opened from Thanon Chira (Korat) to Kon Kaen (115 miles) in the middle of 1933, and a little work has been continued on the further extension since then. Funds have now been provided for the purchase of sleepers in preparation for the platelaying and bridge girdering. A new direct line from Kon Kaen to Nakorn Panom is at present being considered.

MANCHUKUO

Redemption of National Bonds

Messages from Tokyo indicate that National Bonds to the extent of some Y.100,000,000 will be issued before the end of this year to finance the redemption of the £6,000,000 South Manchuria Railway loan due in January next. Sterling funds necessary for the redemption will probably be obtained from gold reserves held by the Yokohama Specie Bank in London, in order to prevent serious fluctuation in the rate of exchange which an outflow of gold from Japan might cause.

Changes in North Manchuria

The N.M.R. management has done away with the Russian practice of providing a berth for every passenger on all trains; on the day trains the compartments now provide only seating accommodation. Carpets and rugs have been taken out of all first and second class compartments and corridors, and this gives the trains a decidedly less attractive appearance. In fact, the impression, which the Trans-Siberian passenger got, when boarding the Chinese Eastern Railway train at Hsinking, that he had left the Far East and had come into touch with Europe, is now a thing of the past. The border line has been removed to Manchouli.

On the whole, however, there appears to be every prospect of a regular and efficient development of this essential link in the Europe-Far Eastern Railway connection under the new management.

CHINA

Hwainan Railway

The good-grade coal mined on the south bank of the Hwai River is now being carried by rail for the first time. The first section of the Hwainan Railway, from the river southwards to Luchowfu, has now been opened, and construction of the second section from Luchowfu to Chaohrien is well in hand and proceeding rapidly. The third section, when built, will bring the line, and the coal, to the Yangtze, opposite Wuhu. The coal will be used for Yangtze shipping and for the new railways running from Wuhu.

Taiyuan-Pingyang Section of the Tatung-Puchow Railway now Open

A further section of the Tatung-Puchow Railway was opened for traffic early in May, when the first train ran through from Pingyang (Linfens) to Taiyuan. The line had been opened as far as Hwohsien (Hwochow), a distance of about 140 miles, some months earlier, but the opening of the further 30-40 miles thence to Pingyang had been held up by constant slips in cuttings, which have had to be cut back. One great hill-slide occurred just when the line was ready for opening, and necessitated the removal of a large slice from the hill. Pingyang is a "fu" city of considerable importance, and has an aerodrome. Trains now leave there at 5 p.m. and reach Taiyuan, the capital of Shansi Province, at 8 a.m. the following day. Suitable connection is made with the Cheng-Tai line by these and the corresponding down trains.

Proposed Hankow-Szechuan Line

Information has now been received from the Ministry of Railways that, as the route of this important line originally proposed was found to be prohibitively costly owing to the mountainous nature of the country traversed, a new survey is now in hand. The route at present being surveyed follows the Yangtze River, and though steamer competition will have to be faced over long distances, there are also long reaches of the river above Ichang where rapids forbid steamer traffic.

OUR CENTENARY—MESSAGES FROM READERS

As announced in our May 3 issue, "The Railway Gazette" and the journals incorporated with it have completed 100 years of continuous publication

THE following is the eleventh and final instalment of the many messages we have received in connection with the centenary of THE RAILWAY GAZETTE and the various railway journals now incorporated with it, the earliest of which made its first appearance on May 1, 1835. In expressing our thanks to all who have written, may we say how greatly we value their appreciative and encouraging messages.

Mr. C. Chaikovsky, Senior Designer, Locomotivoproject Kolomna Works, Golutvin, U.S.S.R.

Allow me to join those congratulating THE RAILWAY GAZETTE on account of its centenary. I like your journal for its being the most interesting of all connected with locomotives.

Personally, as a designer, I'd like to point out that THE RAILWAY GAZETTE represents a source of information on the most advanced practice in locomotive construction of all countries. This is of great interest and practical value. Allow me to convey to you my congratulations and best wishes.

Mr. N. C. Ghosh, Divisional Superintendent, East Indian Railway, Asansol

Permit me to add my congratulations to the vast number that you have already received from railwaymen all over the world on THE RAILWAY GAZETTE attaining 100 years of its existence in May this year. THE RAILWAY GAZETTE is undoubtedly the most comprehensive railway paper existing, and practical railwaymen all over the railway world, I am sure, derive very great benefit from the articles published and the information given in your esteemed publication. The diversity of the subjects concerning railways that are dealt with in the GAZETTE is indeed a very special feature of it, which is very much appreciated by railwaymen engaged in different branches of railway work. My best wishes accompany THE RAILWAY GAZETTE on entering its second century, which is bound to be marked with still greater achievements than in the past.

Mr. C. A. Cardew, New South Wales Government Railways, Redfern.

It is with great pleasure that I send a message to your journal upon completing 100 years of continuous service in the dissemination of technical news to the railway public. Your record, which starts almost at the opening of the history of the railway as a practical means of rapid locomotion, must be nearly unique in the annals of this type of journalism.

When you began publication, the field of technical knowledge and data with regard to railways was almost unexplored, and the extent of this field quite unknown. It was, therefore, a bold venture of faith on the part of those who originated the paper to venture forth as the vehicle through which knowledge of these matters, as it was gradually gained, could be passed on to what must have been, at that time, a strictly limited public.

That you have succeeded in maintaining publication uninterrupted for a complete century is a tribute to the ability of your staff, and those who supply the matter for publication in your magazine, and reflects the faith which the vastly increased railway public of today has in the practical interest and reliability of the articles which you publish. My message upon the completion of your centenary is one of congratulation upon your past achievements, and of hope for your future, that you may continue your useful service to your readers, and maintain your position as the premier railway journal of the British Empire.

I chiefly peruse those articles which relate to the design, construction, operation, tests, and performance of the steam locomotive, or any details connected therewith. I am also interested, though in lesser degree, in articles on signalling and permanent-way matters.

I had been in the habit of treating *The Railway Engineer* as a reference volume on locomotive matters, and here, perhaps, I may be permitted to point out a difficulty arising from the incorporation of this magazine in THE RAILWAY GAZETTE. The latter, being a weekly publication with 52 copies issued per annum, becomes rather unwieldy for purposes of reference when the issues of several years are upon the bookshelves. If it were possible to issue a monthly locomotive supplement, as is now done for diesel, and also electric, traction, I think that the importance of the subject would more than justify it, and it would be a great advantage to readers like myself.

Mr. A. H. Croxton, Rhodesia Railways, Bulawayo, S. Rhodesia.

May your Rhodesian correspondent be allowed to join the great in a personal vote of hearty congratulations to THE RAILWAY GAZETTE in attaining a century. Long may the GAZETTE flourish, because of its value to railwaymen overseas who are enabled to keep in touch with the very latest railway developments at home. I think I have mentioned before that the GAZETTE is circulated round the various offices in the Transportation Department here in Bulawayo and I know it is constantly referred to by members of the staff. Operating and commercial matters appeal to us most, of course, but I must confess the delicious humour in the editorials occasionally appeals to me very much.

Mr. C. J. Rollins, Secretary, Tasmanian Government Railways, Hobart

I have much pleasure in adding my congratulations to the great number which I am sure you will receive from all parts of the world on the occasion of your paper reaching the 100th anniversary of its existence. It is not too much to say that THE RAILWAY GAZETTE holds a very high place indeed in the railway world as an authority on all railway matters, and the opinions expressed therein are accepted as the final word in these subjects. With each section of your publication so specialised that whether traffic, locomotive or maintenance practice, or any other aspect of railway working is under consideration, each article is from the pen of a master in his subject, and the general standard being so uniformly high, it is practically impossible to differentiate between the various sections as to their interest or usefulness, the verdict being given according to the branch of railway work in which the reader himself is engaged. I hope THE RAILWAY GAZETTE will continue to maintain its present standard of excellence and retain the high position in the railway world which it now holds until it is able to celebrate the completion of at least its second century.

Mr. Adolphe-M. Hug, M.I.Mech.E., Consulting Engineer, Thalwil, Zurich

I am very sorry that owing to continuous business travel in several countries of Europe during the first half of this year, I was not able to follow with regularity the technical reviews, and I have just seen that on May 3 of this year THE RAILWAY GAZETTE has completed a hundred years of continuous publication. I should have been very pleased to congratulate you at the right time, but, as this has not been possible, I am doing it now herewith very sincerely. You have accomplished successfully a task which has been of great value in assisting railway progress, and THE RAILWAY GAZETTE is certainly one of the most complete and best informed of such journals, if not actually pre-eminent, and is for me personally of the greatest value. I wish you all a prosperous future.

XUM

IMPRESSIONS OF OVERSEAS TRANSPORT

XXIII—The Ceylon Government Railways

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

THE call at Colombo on the way back from Australia gave an opportunity of seeing something of the railways of Ceylon, in which I have been interested ever since the late General Manager, a former colleague of mine, left Paddington some years ago to take up a position on the railways of that country. There is probably no place in the world that surpasses this small but beautiful island for diversity of interest and amusement, and the thousand miles of Government-owned railways which stretch over the greater part of the country form the best, and in the jungle districts practically the only, means of communication.

Although the main line to the north and Talaimannar, whence ferry boats run across the strait to Danushkodi (22 miles) on the mainland of India, is probably the most important from the through traffic point of view, the lines running south-east to Kandy and the hill country, the tea and rubber plantations and the popular holiday resorts, are the most interesting.

Colombo Fort is the central station at Colombo, but Maradana is situated at the junction for the main and coast lines. The broad gauge coaches of the C.G.R. are roomy and comfortable, and excellent sleeping cars are provided on the night trains, by which the traveller finds himself in Nuwara Ellya, the holiday resort of the hill country, in time for breakfast next morning. The journey by day, however, is more interesting as the scenery *en route* is the most beautiful in Ceylon. The line is double to Polgahawela (45 miles from Colombo) where it bifurcates, the main line north to Talaimannar and Kankesanturai and the lines to Trincomalee and Batticaloa, east coast ports, separating at Maho Junction, 40 miles farther on.

Soon after leaving Polgahawela the railway begins to climb the Kadugannawa incline, which rises in a distance of 20 miles from 126 ft. to 1,690 ft. above sea level, the ruling gradient being 1 in 46. The slow speed up this incline gives an opportunity of seeing the marvellous hill scenery which reveals itself as the train mounts higher and higher. The track here is cut out of the solid rock and as one looks down from the narrow shelf on which the train is perched the sheer drop of 1,000 ft. to the plains below is most thrilling.

Kadugannawa, at the top of the incline, is the place where the large engines used to assist the trains are stabled, and a short run on the level brings us to Kandy, the ancient capital of Ceylon, situated in beautiful surroundings. The town lies in a hollow surrounded by towering hills and is built round an artificial lake, at the side of which stands the Sacred Temple of the Tooth, containing, it is said, an actual tooth of the Buddha and many other relics. The temple is a place much revered by Buddhists, but it seemed dirty and dilapidated, while the approaches were thronged with importunate beggars, many of them with shrivelled limbs and every imaginable deformity.

The station at Peradeniya, just before reaching Kandy, is close to the famous Botanical Gardens, in which may be seen growing nutmegs, cloves, pepper and other tropical products. At Katugastota, a station farther on, an interesting sight is that of elephants bathing after their day's work. As many as thirty of these huge beasts may be seen rolling over and over in the water or being cleaned by their mahouts.

From Peradeniya a branch line 17 miles long runs up to Matale, a rubber, cocoa and tea-planting centre, through groves of cocoa trees with their many coloured pods. Southward the railway passes through beautiful hill country to Badulla, tea plantations clothing the hillsides, and factories and the bungalows of the planters dotting the landscape.

Nawalapitiya, 23 miles from Kandy, is the Divisional Headquarters and a large railway centre. From Hatton, the next station, thousands of pilgrims essay the long and arduous climb of Adam's Peak, the sacred mountain on which there is said to be a footprint of the Buddha. At Nanuoya the tea estates end and dense jungle supervenes. Nanuoya is the junction for Nuwara Ellya a delightful holiday resort, 6,198 ft. above sea level, which is reached by a narrow gauge line (2 ft. 6 in.) with a ruling gradient of 1 in 26. This is the favourite resort of British residents in Colombo, the climate being bracing and healthy and the nearest approach to that of England. Many excellent clubs and hotels exist in Nuwara Ellya with plenty of facilities for golf, tennis and other sports. In March, April and May, Colombo people migrate in large numbers to this popular hill resort, the climate of which makes it a delightful change from the low country round the capital.

The railway to Badulla reaches summit level at Pattipola, a lonely station in the heart of the jungle. On emerging from the summit tunnel the jungle has disappeared and miles of open country meet the eye. After passing Diyatalawa and Bandarawela, another popular health resort, the railway, still descending, terminates at Badulla, the capital of the province of Uva and the centre of another large tea-growing area.

Three other sections of the C.G.R. radiate from Colombo—the Puttalam line to the north, another along the coast to the south, and the third a narrow gauge line through the fertile Kelaniya Valley. Negombo on the Puttalam line is a popular seaside resort for Colombo residents, who flock there in large numbers, particularly at the week-end, to bathe and to partake of the celebrated "fish tiffins" at the Government Rest House.

The line to the south passes Mount Lavinia, which is a favourite seabathing resort, and, skirting the sea throughout its entire length, runs through groves of coconut palms to Galle, the capital of the southern province, and then on to Matara (97 miles). It is proposed to extend this line to Tangalla, some miles farther inland.

The Kelaniya Valley Railway runs through an important rubber-growing district to Opanake. Ratnapura, the principal town on the line, is the source of the Ceylon jewels—rubies, sapphires, and other gems.

The suburban traffic within a radius of 25 miles from Colombo is very heavy night and morning, particularly on the coast line to Mount Lavinia. Pilgrim traffic in connection with religious festivities at Kandy, Anuradhapura and Madhu is also very heavy on full moon days and at certain other seasons, requiring special arrangements for working, for as many as 50,000 pilgrims travel by rail to one of these festivals.

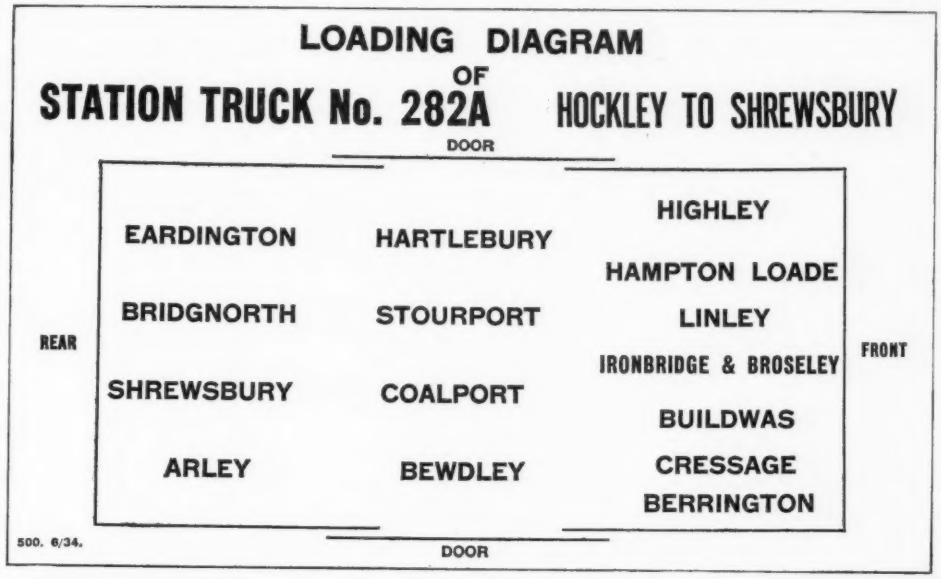
STATION TRUCK WORKING ON THE G.W.R.

A flexible system for working inter-station goods traffic, in which a constant check on loads conveyed assists in the planning of schedules

STATION TRUCK is the name applied by the Great Western Railway Company to the goods vehicle which is sent from one depot to a destination over a predetermined section of the line for the purpose of discharging and picking up traffic at a number of stations intermediately. More than 600 station trucks operate daily. These trucks convey goods from smaller stations to transhipment depots for amalgamation with other goods, and from one station to another on the route served by such trucks; they are also utilised for the distribution of articles from transhipment depots to wayside stations.

Every station truck works to a pre-arranged programme, and all the calls to be made for the purpose of setting down and picking up goods, as well as the trains on which it is to be conveyed from point to point, are scheduled. A special label is printed for each vehicle bearing a list of the stations to be served, and the trains by which it is to be taken from place to place. The quantity of goods actually conveyed by the station trucks is kept under review, and adjustments in the stations to be served made when, through any change in the flow of traffic, this becomes desirable. Additional trucks are introduced when the need arises.

A definite method of stowing the goods in these trucks in station order has to be applied. As each truck conveys articles to be taken out at a number of stations, confusion and delays would be caused if the consignments for, say, the first station at which a truck calls were covered or made inaccessible by articles to come out later in the journey. The practice was to stow the goods in the trucks at their starting points in a manner proved by experience to be desirable, but a progressive development in this respect



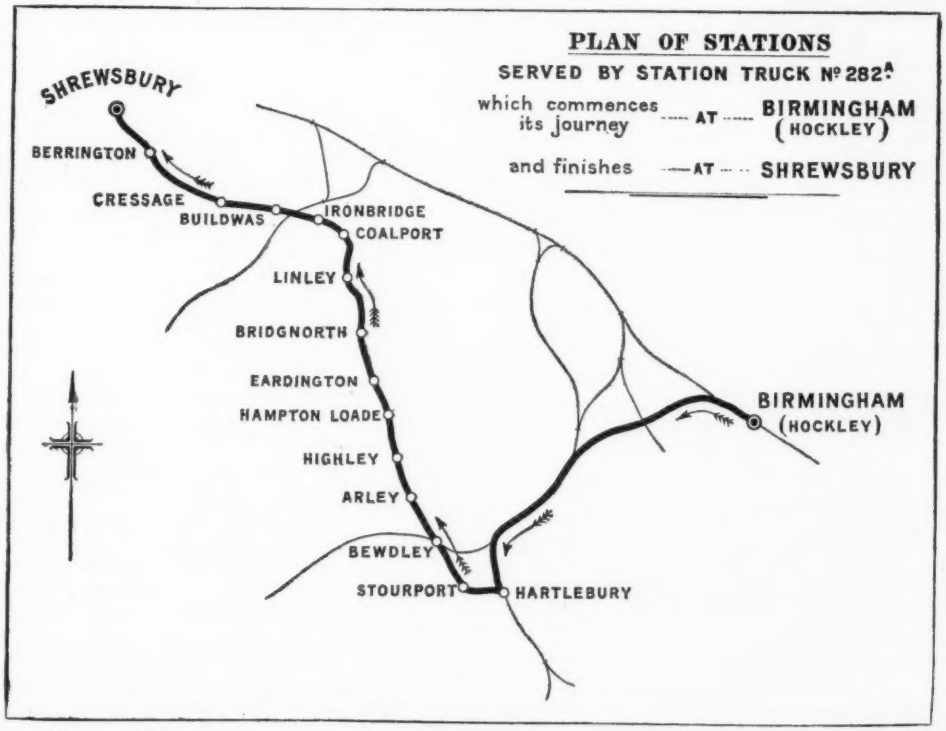


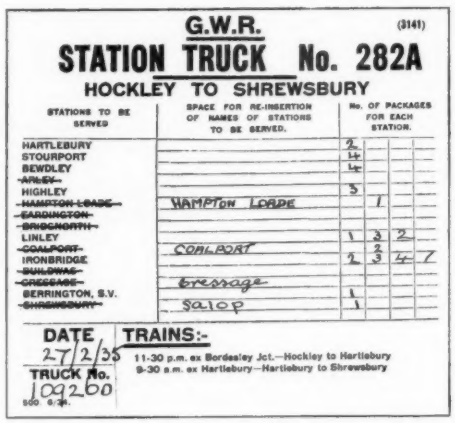
Diagram (above) showing method of stowing packages in truck to facilitate unloading, and plan (below) illustrating stations served on the journey

on the Great Western Railway is the recent introduction of printed loading diagrams, or stowing plans. One such diagram has been prepared for each station truck, and a specimen is reproduced on page 105. Each plan is designed so that the loading of the trucks may be performed with due regard to the operations of discharging as the stations served by the trucks are, in turn, reached. Reference to the stowing plan and the accompanying diagram illustrating the journey of station truck 282 A, will show that the goods for the first station served by the truck (Hartlebury) are loaded just inside one of the wagon doors, so as to be readily unloaded on arrival at that station. Thus, a clear space is made available, and easy access is given to the goods for the next station (Stourport). This operation continues until the discharging of the truck is completed.

To preclude the possibility of overcarrying goods, it is considered necessary to supplement the information as to the location of goods in the truck for a particular station by an indication as to what has to be unloaded. There was a time when this was done by making a complete tally of the goods contained in every station truck, and the list was added to as packages were placed in the truck at any of its stopping places. From this detailed tally (the station truck list) the staff at the unloading stations were able to see what articles had to be taken from the trucks. Altered shed checking arrangements on the Great Western Railway now make the preparation of such detailed lists a matter of difficulty. They were prepared at the starting points of the individual station trucks (generally transhipment depots) from the invoices; but simultaneously with the introduction of the printed stowing plans, the station truck list was superseded by a much abridged list which is embodied in the set up of the station truck label. This involves inserting in the spaces provided on the label the number of articles loaded in the truck for each point *en route*.

The loaders at the starting points of the trucks strike off the labels the names of any stations for which no articles have been loaded. This is to afford a clear indication to the staff along the line at what stations the trucks have to be opened for goods to be taken out. Provision is made for re-inserting the names of the " struck out " stations in the event of articles for them being placed in the truck at intermediate points. The staff responsible for discharging the trucks are thus able to see from the labels how many articles, if any, have to come out, and, by reference to the stowing plans, to know in what part of the trucks they are to be found.

The label printed for station truck No. 282 A, starting at Birmingham (Hockley depot) and working to Shrewsbury via the Severn Valley Line, and calling at fifteen stations on its journey, is reproduced on this page. The spaces for indicating the number of packages (if any) loaded for each station and particulars of the train services conveying it. will be observed. This illustration shows that the truck left Birmingham with goods for Hartlebury, Stourport, Bewdley, Highley, Linley, Ironbridge and Berrington, the names of the remaining stations being struck out. At two stations *en route* consignments were added for Linley, and at three stations some were added for Ironbridge. After the truck had left Hockley, intermediate points loaded into it consignments for Hampton Loade, Coalport, Cressage and Shrewsbury, necessitating the re-insertion of these stations' names on the list, but on this particular journey no goods were conveyed for Eardington, Bridgnorth or Buildwas. These arrangements


G.W.R. (3141)

STATION TRUCK No. 282A

HOCKLEY TO SHREWSBURY

STATIONS TO BE SERVED	SPACE FOR RE-INSERTION OF NAMES OF STATIONS TO BE SERVED.	No. OF PACKAGES FOR EACH STATION.
HARTLEBURY		2
STOURPORT		4
BEWDLEY		4
~~ARLEY~~		
HIGHLEY		5
~~HAMPTON LOADE~~	HAMPTON LOADE	1
~~EARDINGTON~~		
~~BRIDGNORTH~~		
LINLEY		1 3 2
~~COALPORT~~	COALPORT	2
IRONBRIDGE		2 3 4 1
~~BUILDWAS~~		
~~CRESSAGE~~	Cressage	
BERRINGTON, S.V.		1
~~SHREWSBURY~~	Salop	1

DATE 27/2/35

TRUCK No. 109200

TRAINS:- 11-30 p.m. ex Bordesley Jct.—Hockley to Hartlebury
9-30 a.m. ex Hartlebury—Hartlebury to Shrewsbury

Label showing load on truck at start of journey, and stations at which packages were discharged

are designed to reduce to a minimum the time occupied in unloading the trucks, and to avoid the detention of trains beyond their booked times for station truck work.

When the journey is completed the loading diagrams are returned to the starting points for further use. The labels are retained at the terminating points for subsequent examination to see in what direction it may be desirable to vary the schedule. If, for instance, a station truck arrives at the end of its journey with the label indicating regularly that no goods were conveyed for one or more of the stations covered by its programme, adjustments are made in the scheduled stops of the train and to the loading diagram. These methods coupled with the reorganisation of transhipment arrangements, completed in 1932, and the general speeding up of freight trains, have brought about a considerable reduction in the transit times of small consignments to country stations, and delivery from large centres to many villages can now be effected the day following despatch. For example a truck sent each night from Paddington Goods with merchandise mainly in small consignments for Gwinear Road, Praze, Nanegollan and Helston, in Cornwall, is available for delivery at those places the following day.

The Temperance Movement on the Reichsbahn

It was not until about 12 years ago that a temperance society was formed among the staff and employees of the German State Railway, as an offshoot of the German Anti-Alcohol League. In 1928 the management took steps to give official encouragement to the temperance movement, recommending railwaymen to join it and expressing the hope that many of the officers would do so too. At the same time opportunities were afforded for lectures to be given and literature to be distributed dealing with the evils of alcoholic excess. Although the movement made headway—from 2 branch societies, with 200 members, in 1923 to 72 societies and 8,457 members in 1933, and probably now 10,000 members—it could not be regarded as very successful seeing that some 630,000 persons are employed by the Reichsbahn. Renewed efforts are now being made to encourage it, in view of the greater care necessitated by the increasingly faster traffic and the grave dangers to which drinking might lead. The production of non-alcoholic drinks and their sale at the canteens and stations are being fostered as much as possible and, as Herr Sonntagg points out in *Die Reichsbahn*, the propaganda in favour of temperate living has received an additional incentive, likely to lead to good results, from the fact that the *Führer* is a strict teetotaler.

PASSENGER TRAFFIC STATISTICS, 1923-1934

A critical analysis of certain statistics of the British main line railways brings out some interesting points

THE annual working returns of the amalgamated railways of Great Britain date back to 1923 and cover a period of phenomenal development in various competitive forms of passenger transport, both on the roads and in the air. On the road the omnibus has taken many

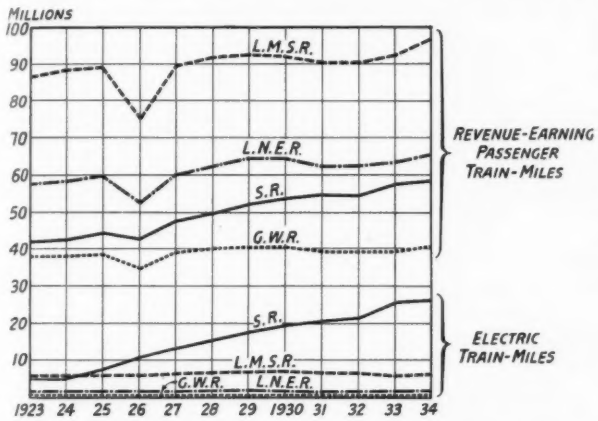


Chart No. I—Revenue-earning passenger train-miles and electric train-miles

short distance passengers from the railways, and the fast motor coach has claimed a substantial share of the medium and to a less degree of the long-distance traffic, while since pre-war days the private motorcar has continued to divert an ever increasing number of travellers to the road. Air transport constitutes a threat to long distance passenger traffic, and though still in its infancy the number of passengers carried by this means is increasing.

It is interesting to study how the railways have fared in face of all this competition, so far as it is possible to do so from the published annual returns. During the period under review, the Southern has introduced electrified working on a large scale, which adds to the interest of the investigation. It cannot, of course, be argued that the statistics dealt with contribute any conclusive evidence as to the value of electrification in arresting road competition, owing to the number of important factors which have been present during the past decade and which have themselves varied both in time and degree in different areas. Moreover, conditions as regards density of population, &c., are hardly parallel in any two instances. Since lack of reliable data precludes the quantification of the disturbing effect of these factors upon the traffic of any given railway, the accompanying charts cannot be regarded as other than pointers indicating the general trend of passenger working and revenue on the four amalgamated railways. The accuracy of any deductions which can be derived therefrom by the reader will be dependent upon his individual knowledge of the extent to which such extraneous influences as local trade prosperity or depression have influenced the results.

Chart No. I shows the annual revenue earning passenger train-miles, and gives some indication of the train services provided. The drop in 1926 was, of course, due to the prolonged coal strike and the general strike of that year. It will be noted that there has been an upward tendency except in the case of the Great Western, where, since 1928, the figure has remained almost constant at 40 million miles; there has been a steady and substantial increase on the Southern. At the bottom of this chart will be found the electric train-miles; on the Southern these have grown from about 5 to some 26 millions in twelve years, which more than accounts for the total increase in passenger train-miles on that line; the other railways show no material change during this period.

It is claimed that multiple unit electrical operation is conducive to a reduction in shunting mileage, and the truth of this is demonstrated strikingly in Chart No. II, which indicates the number of revenue earning passenger train-miles run for each mile of shunting. It will be noted that while the Great Western Railway figure has fallen slightly from 15·0 to 14·7 miles, that for the L.N.E.R. has increased from 15·0 to 15·6 miles and the L.M.S.R. from 11·2 to 12·9 miles. The improvement on the Southern is quite startling; in 1923 the figure stood at 15·6 miles, or only slightly better than the G.W.R. and L.N.E.R., but by 1933 this had grown to 22·8 miles.

It will perhaps be appropriate to turn here to the revenue earned by these services. This is given in Chart No. III. The serious decrease in passenger revenue since 1925, the year before the general strike, is very clear. The severity of the decline varies, however, as may be seen by comparing the L.N.E.R. and the Southern figures. In 1923 passenger receipts on the L.N.E.R. exceeded those on the Southern by nearly £5,000,000, whereas in 1934 the difference was only about £1,000,000. It is not suggested

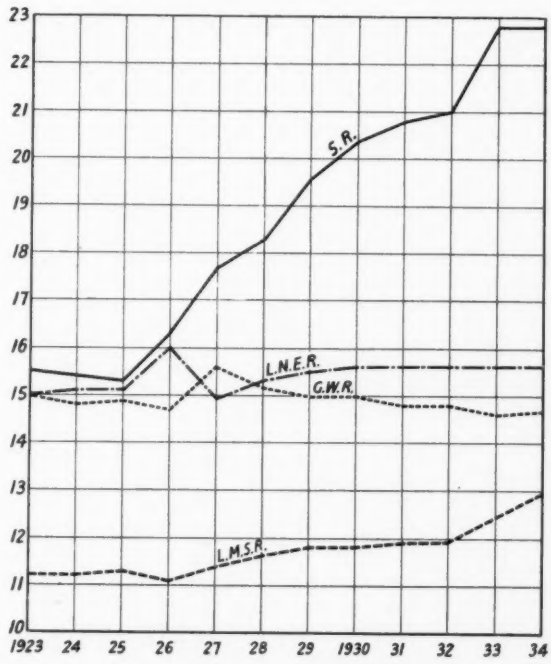


Chart No. II—Revenue-earning passenger train-miles per shunting (coaching) train-mile

XUM

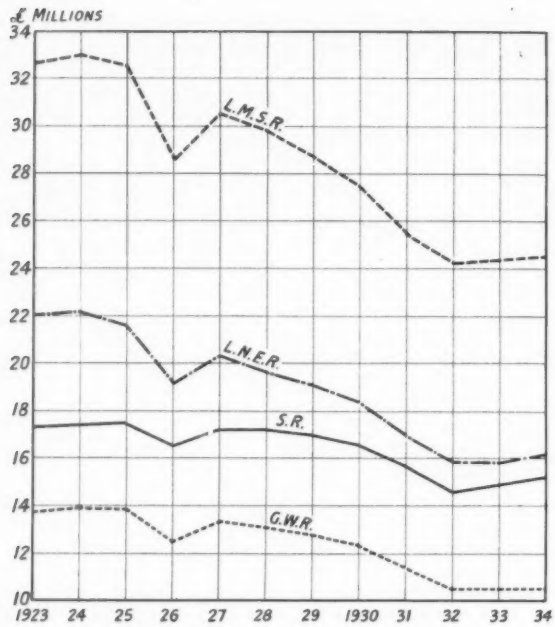


Chart No. III—Passenger train receipts

that this has been brought about entirely by electrification on the latter railway. The trade depression of recent years has been far more severe in those areas served by the other three groups than it has been in Southern territory, which has remained relatively prosperous.

Chart IV shows that the number of passengers carried, excluding those travelling with workmen's tickets and season tickets has dropped generally except on the Southern, but not proportionately to the decline in receipts. This can be accounted for by reductions in fares. There can, however, be no doubt that electric traction, with its increase in speed and frequency of service, has done much to combat road competition particularly as regards the outer suburban passenger. Confirmation of this is found in Charts Nos. V and VI, which show the workmen's ticket travellers and the number of season ticket holders respectively. Even when allowance

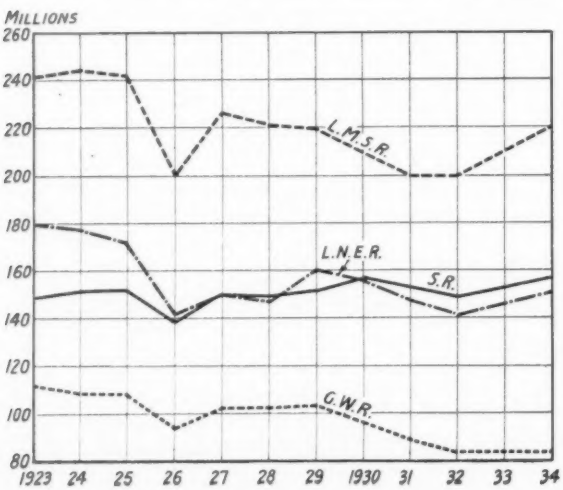


Chart No. IV—Ordinary passengers carried, excluding workmen and season tickets

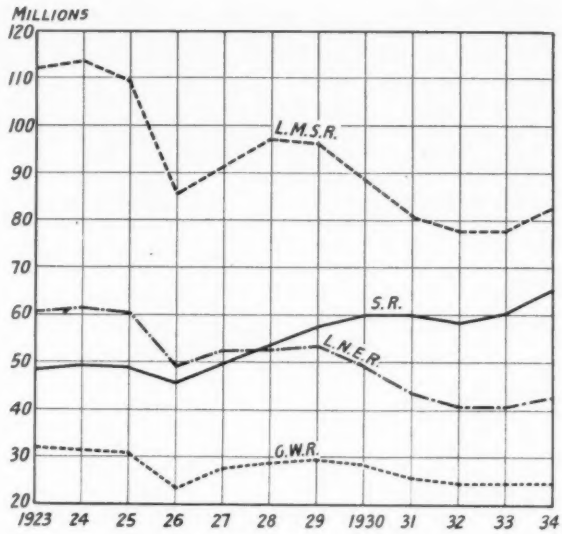


Chart No. V—Workmen's tickets

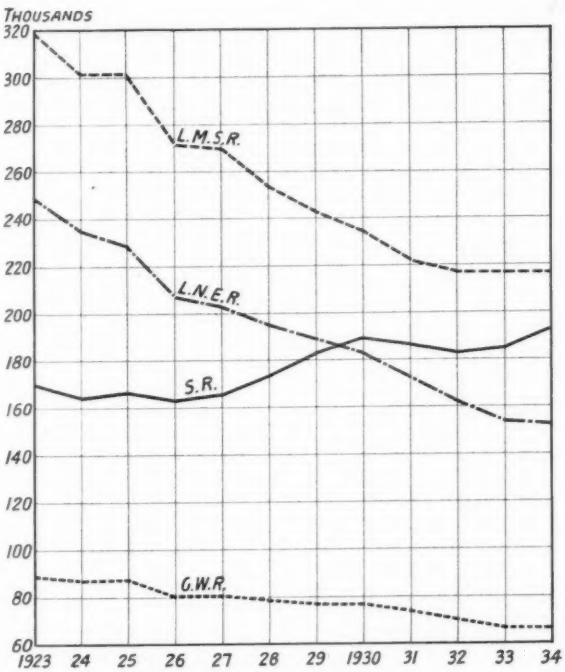


Chart No. VI—Season ticket holders

is made for the unequal incidence of trade depression the difference between the Southern and the other railways is marked.

Reverting to the question of relative operating efficiency, the published returns are not very helpful since the proportion of the working costs incurred on account of steam and electrified working respectively cannot be closely ascertained. The tables showing the number of passenger vehicles owned are unsatisfactory owing to the wide variations in their carrying capacity; the number of seats or berths provided gives more reliable information and this is shown in Chart No. VII. It will be seen from this chart that the total carrying capacity of the passenger stock on the G.W.R. and the Southern Railway is prac-

tically the same as it was in 1923; on the L.N.E.R. it is less and on the L.M.S.R. considerably greater.

The use to which this stock is put may be deduced from Chart No. VIII, which shows the number of passengers carried per seat or berth per annum. The improvement on the Southern is again noticeable. It would be quite natural to assume that most of the passengers on this line are carried only short distances. Perhaps a better comparison is furnished by Chart No. IX, showing passenger receipts per seat. On this basis too the Southern results appear satisfactory, receipts from passengers using the

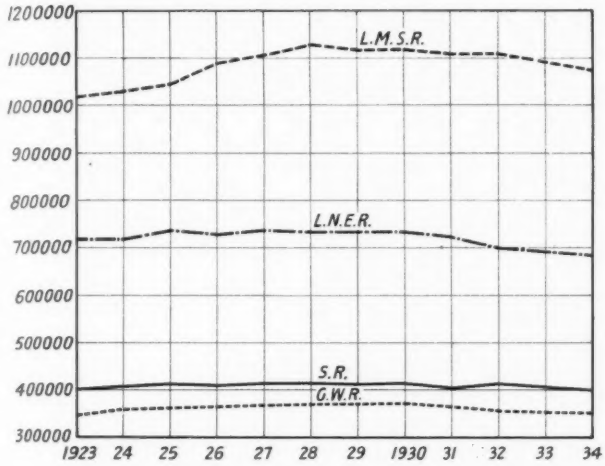


Chart No. VII—Number of passenger seats or berths

electrified services during 1934 having amounted to some £6,211,000, an estimated increase of £1,850,000 upon the receipts from the same area for the last year of steam working, and the number of passengers on the electrified main line having increased from 1,900,000 in 1932—the last year of steam operation—to 2,600,000 last year.*

These satisfactory results are largely confirmed by the

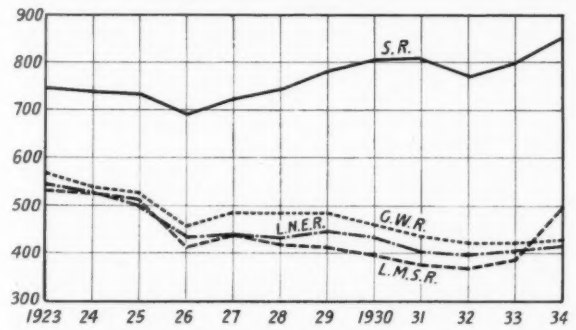


Chart No. VIII—Passengers conveyed per seat per annum

charts and point to the conclusion that on the Southern the decline in passenger revenue due to road competition has been successfully combated. Whether similar treatment on the other amalgamated railways would be equally successful is a matter of opinion. The Southern is primarily a passenger carrying line and some 75 per cent. of its revenue is derived from this source, while on the other lines only between 36 per cent. and 42 per cent. is so obtained. Moreover, it is unlikely that the electrification of goods services would lead to any appreciable increase in revenue from such traffic.

* See the *Electric Railway Traction Supplement* April 5, p. 665.

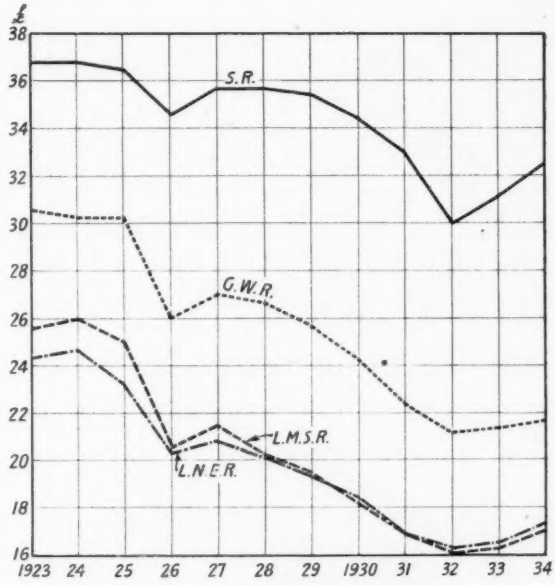


Chart No. IX—Passenger receipts per seat

It is significant that at the last general meeting of the L.M.S.R., Sir Josiah Stamp was unable to speak hopefully of further electrification on that line; similarly, the Chairman of the L.N.E.R. told the shareholders that " the Directors came to the conclusion that in the absence of a pool of competing interests and of substantial Government assistance, electrification of the Great Eastern suburban lines could not be other than a losing proposition."

These grave statements lead to the obvious conclusion that suburban traffic in certain areas has reached such a stage that the capital outlay necessary to provide adequate services cannot be justified at the present fares. The real crux of the matter is the steady approach to a uniform working day for all classes, beginning about 8.0 to 9.0 a.m. and ending from 5.0 to 6.0 p.m., which has increased the density of the peak loads and decreased their duration. Severe peak loads are no more economical for transport undertakings than they are for electric power companies. Nor are they in the interests of public health and comfort. While the circumstances that create their necessity are tolerated by the public, however, they will form an increasingly difficult problem, and it remains to be seen whether a solution is possible. It is not yet in sight.

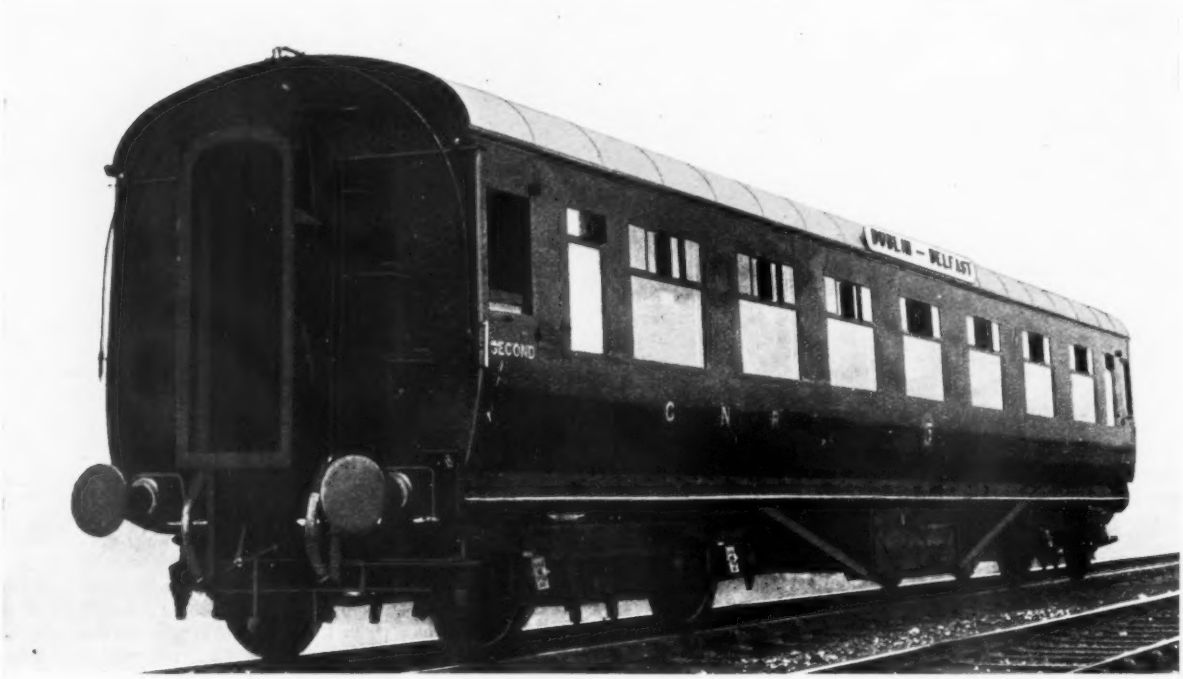
A London Transport Discovery.—During excavations at the old Roman wall on Tower Hill in 1852 fragments of a Roman tomb, including a large stone block bearing part of a memorial inscription, were discovered. This has long stood in the Roman Gallery of the British Museum. Further excavations this year, in connection with railway works of the London Passenger Transport Board, have resulted in the discovery of another similar block, continuing the inscription, which now reads : DIS. [M]ANIBVS. [C.IVL.C.F.F]AB. ALPINI. CLASSICIANI. PROC. PROVINC. BRIT[ANN.] IVLIA. INDI. FILIA. PACATA. I[NFELIX.] VXOR. It is now possible, therefore, to identify the tomb as that of the Classicianus mentioned in Tacitus (" Annals," xiv, 38), and to date the tomb as about A.D. 66. The newly found block has been presented to the museum by the London Passenger Transport Board, and all the fragments of the tomb are now being assembled in a reconstruction of the original.

XUM

NEW COACHES AND BUFFET CARS, G.N.R. (IRELAND)

Ten new vehicles for G.N.R. (Ireland) main line services have windows designed to give an improved outlook and a mechanical ventilating system in the first and second class coaches

IN keeping with its progressive policy, the Great Northern Railway Company (Ireland) has recently reviewed its carriage building programme and brought it into line with modern requirements and practice. The work at present in hand at Dundalk comprises the construction of ten new main line bogie coaches, 58 ft. long, five for first and second class passengers, three for third class passengers and two buffet cars of a new design. These vehicles are to be used on the Dublin-Belfast and Belfast-Londonderry services.



New second class coach for G.N.R. (Ireland) inter-capital services between Northern Ireland and the Free State

The underframe and bogies are of standard steel sections and flats. The framework of the bodies is of mahogany, and the outer panels of the sides and the roof are of steel plates, finished to correspond with the existing stock. The interior arrangements are flush finished throughout, with walnut in the first class compartments, mahogany in the second class, and oak in the third class; all exposed woodwork is french polished. A large plate glass window is provided in each compartment, surmounted by a glazed opening panel, and the corridor doors are double, so as to give the maximum unobstructed view. The compartments in the first and second class coaches are provided with doors on the corridor side only. The seating is entirely of latex rubber.

The first and second class coaches are equipped with special ventilating plant, in which the incoming air is twice filtered, heated to the required degree, and blown by an electrically operated fan into each compartment through openings, one under each seat, from a continuous duct arranged in such a manner that draughts are avoided. The outgoing air is removed through openings, ducts, and extractors arranged along the roof, above the corridor. The temperature in the compartment is thermostatically controlled from the steam heating pipe.

The three third class coaches are of the centre-corridor type, seating 70 passengers in four large compartments separated by glazed partitions with connecting doors. The windows of these carriages are similar to those of the first and second class coaches, and the seating consists of large tubular-frame seats comfortably upholstered in rubber, each accommodating two passengers.

Each buffet car is capable of seating 40 passengers in separate chairs, and will be provided with a snack bar, fully equipped, including tubular-frame bar stools. A kitchen and pantry arranged at one end of each car give facilities for cooking, which will be done on a gas range using high-pressure gas stored in gas cylinders situated under the floor of the coach. The buffet cars are equipped with a refrigerator. The chairs, tables and stools are of chromium plated tubular framework, and the inside finish of the coaches will be polished oak. All the new coaches have lavatory accommodation with hot and cold water laid on. The vehicles were designed by the company's Chief Engineer, Mr. George B. Howden, M.Inst.C.E. and built in the company's works at Dundalk.

SOUTHERN RAILWAY AND THE NAVAL REVIEW

Some of the measures that made possible a remarkable feat of combined rail and steamer transportation

ON the occasion of the King's Jubilee Review of his Fleet at Spithead on Tuesday, July 16, some remarkable achievements of transport were performed by the Southern Railway. Though the arrangements of special train and steamer workings were spread over several days, it was the concentrated traffic rushes on the Tuesday that called for the greatest feat of transportation ever attempted by that railway. To give some idea of its magnitude it may be noted that 102 additional trains—carrying about 30,000 passengers—were run on July 16 and the night of the 16th-17th, and 18 of the company's steamers, in addition to numerous others, great and small, were used to carry these passengers between Southampton or Portsmouth and Spithead and back.

The rush of sightseers started on Saturday, 13th and Sunday, 14th, and on Monday, 15th, eleven special trains, ten of them connecting with seven specially chartered liners, left Waterloo for Southampton. Also on the day of the review six trains were required for the Royal Navy, its guests and the Staff, and ran from Victoria to Portsmouth. One electric special also ran from Victoria to Newhaven, whence a steamer proceeded to the review. There were other specials from the country districts also.

The Rush of Special Traffic

But the principal rush was into Southampton and Portsmouth between 7.55 a.m. and 1.45 p.m. on Tuesday when 46 additional trains were sandwiched between the ordinary workings. Each had to connect with its appropriate steamer, and the latter had to bring back its passengers punctually for the return journey to Waterloo. Then in the evening a further four specials were run, two to Southampton and two to Portsmouth, to carry those who wanted to see the fleet illuminations only. The return workings were complicated by some of them being immediately after the review and others not till the early hours of the morning of July 17, after the fleet illuminations. When it is realised that with five exceptions, the 102 trains used were all of corridor or Pullman stock and almost all were provided with restaurant facilities—in some cases as many as five Pullman or other restaurant cars were included in a special train—and that the trains loaded to from 10 to 13 coaches for Southampton and 9 or 10 over the more heavily graded line to Portsmouth, some idea of the complexity of this aspect of the problem will be gleaned. The following table indicates the volume of traffic handled and numbers of trains cancelled or altered:—

Summary of Outgoing Special Traffic on July 16	
Victoria—Portsmouth	6
Waterloo— ,,	16
,, —Southampton	22
G.W.R.— ,,	2
Victoria—Newhaven	1
Weymouth—Portsmouth	1
Brockenhurst—Lymington	2
Seaford—Newhaven	1
Total	51
Cancellations and Alterations of Trains on July 16	
Suburban electrics cancelled	18
Special ,, run	17
London—Portsmouth trains cancelled	6
Other services cancelled	23

Interest also attaches to the number of corridor coaches and restaurant cars, including Pullmans, collected in London for this special traffic without depleting the normal services, and to the variety of interests served by the special trains: both features are illustrated by the table overleaf. From this table it will be noticed that no fewer than 389 additional corridor coaches, including 66 restaurant cars, were provided for the special trains out of London alone.

The magnitude of the task of arranging the details for all these and their complementary empty train and engine workings, disposal of empty stock, cleaning, watering, and gassing, steamer berthing and for ensuring a clockwork-like regularity of all operations, both train and steamer—not to mention the exhaustive and protracted negotiations necessary with sundry tourist agencies, Naval and other outside bodies—involved months of planning. In fact, preliminary meetings to discuss matters were held as long ago as January, and by March the scheme as a whole had taken shape.

Difficulty in Estimating Accommodation Required

The greatest difficulty experienced was to estimate the number of passengers expected to travel by each train, the number staying late for the illuminations, and the number of trains and steamers required. The advertising and disposal of tickets was originally entrusted to the tourist agencies, and they in turn found it most difficult to estimate correctly the accommodation they required at specific times and for the different trips arranged. As some of the agencies did not sell as many tickets as expected, the Southern Railway itself eventually took over the issue of large numbers of tickets.

Details of Working Arrangements

From the operating point of view every detail was planned out minutely and a 98-page Special Traffic Arrangements book of instructions, supplemented by a 54-page Carriage Working Notice book, was printed for the guidance of the staff. In addition, summaries of special workings, printed leaflets of local alterations, as well as lists of cancelled, altered and additional train and steamer services were issued for public distribution.

The Special Traffic Arrangement book gave general instructions to all staff, and showed diagrammatically the special engine head codes for the various routes. Every train carried a number, black for ordinary and red for special trains. There were also lists of the latest steamer services to and from the Isle of Wight before the review and the first services after it. Special instructions for milk train traffic, freight train alterations, gassing and cleaning of stock, and with regard to the opening of signal boxes, were included. Not only was every existing box brought into use, but, between Rowland's Castle and Petersfield, a new box was provided to facilitate up line working during rush periods. This volume also contained complete revised working timetables and details of the formation of all trains.

Then too, detailed instructions were issued to individual members of the staff, to stationmasters, to signal and telegraph linemen at 42 stations, to guards and stand-by guards, to locomotive and traffic inspectors and to control

XUM

Table showing quantity of additional corridor stock used and variety of interests served by specials ex London

Departure time	Total Load	No. of restaurant cars	Destination	Connecting steamer	Run for
TRAINS LEAVING WATERLOO BETWEEN 6.30 A.M. AND NOON ON JULY 16					
6 42	*	—	Portsmouth	*Britannia* *Crested Eagle*	S.R. excursion.
6 50	†	—	Alton and Eastleigh	—	
7 25	10	1	,,	*Britannia*	Frames.
7 35	10	—	,,	*Crested Eagle*	Gen. Steam Nav'n.
7 45	†	—	Haslemere	—	
7 50	10	—	Southampton	*Crested Eagle*	Gen. Steam Nav'n.
8 0	10	1	,,	*Medina* *Lorna Doone*	Polytechnic.
8 6	†	—	Basingstoke	—	
8 10	11	1	Southampton	*Solent Queen* *Nevasa* *Discovery II*	R.N.V.R., Board of Trade and *Discovery II*.
8 15	10	1	,,	*Biarritz* ...	Press, Ashton Mitchell, &c.
8 15	†	—	Effingham ...	—	
8 20	10	1	Southampton	*Versailles* ...	Continental party.
8 26	10	1	,,	*Biarritz* ...	S.R. special.
8 30	†	—	,,	—	
8 35	12	5	,,	*Prince of Wales, Vestal, Brittany*	Trinity House and Firth-Brown.
8 40	†	—	Plymouth ...	—	
8 45	Relief	to 8.50	,, ...	—	
8 50	†	—	Portsmouth...	—	
8 55	10	—	,, ...	*Merstone* ...	National Tours.
9 5	13	1	Southampton	*Warwick C'stle*	Union-Castle.
9 10	10	—	,,	*Royal Eagle*...	Sir H. Lunn.
9 20	11	5	,,	*Twickenham Ferry*	Directors' party.
9 25	10	2	,,	*Balmoral* ...	Cook.
9 30	†	—	,,	—	
9 35	10	—	,,	*Royal Eagle*...	Sir H. Lunn.
9 35	†	—	Guildford ...	—	
9 40	12	1	Southampton	*Canterbury* *Flying Kestrel*	Hickie Borman.
9 45	10	1	,, ...	*Normannia* ...	Cook.
9 50	9	4	Portsmouth...	*Maine* ... *Enchantress*	Admiralty.
9 55	9	1	Southampton	*Greetings* ... *Kenia*	Hickie Borman.
10 00	9	4	Portsmouth...	*Maine* *Alresford*	Admiralty.
10 4	*	—	,, ...	*Portsdown*	Pickfords, Dean & Dawson, & S.R.
10 10	9	4	,, ...	*Maine* ...	Admiralty.
10 15	9	1	Southampton	*Isle of Sark* ...	Pickfords.
10 15	†	—	Guildford		
10 20	12	1	Southampton	*Isle of Guernsey*	
10 24	†	—	Fareham ...	—	
10 30	†	—	Southampton	—	
10 35	†	—	Ilfracombe ...	—	
10 42	11	1	Southampton	*Dinard* ...	Pickfords, Institute of Naval Architects, &c.
10 50	10	4	Portsmouth...	*Southsea* ...	Admiralty.
11 0	†	—	Atlantic Coast	Express	
11 4	10	4	Portsmouth...	*Southsea* ...	,,
11 12	10	4	,, ...	*Whippingham*	,,
11 20	10	4	,, ...	,,	,,
11 39	*	—	,, ...	—	S.R. excursion.
12 0	*	—	,, ...	—	,,
VICTORIA TO PORTSMOUTH AND NEWHAVEN					
7 25	10	1	Portsmouth...	—	Navy and Staff.
7 33	10	1	,, ...	—	,,
7 42	Electric		Newhaven ...	*Paris*	
7 44	10	1	Portsmouth...	—	Navy and Staff.
7 50	10	1	,, ...	—	,,
7 59	10	1	,, ...	—	,,
8 38	10	4	,, ...	—	,,
EVENING SPECIALS FOR FLEET ILLUMINATIONS					
5 17	10	1	Portsmouth...	*Sandown* ...	Pickfords.
5 34	10	1	,, ...	,, ...	,,
5 49	12	1	Southampton	*Royal Eagle*...	Sir. H. Lunn.
6 30	10	1	,,	*Crested Eagle*	Gen. Steam Nav'n.
Total	389	66			

* Non-corridor † Ordinary

offices. Information about every train was telephoned ahead to control and divisional offices.

Due to the heavy demand upon Portsmouth and Southampton for gas by the very large numbers of restaurant cars, some eight trains which each included four or five cars had to be sent to Eastleigh for gassing. As far as possible standard times were worked to by all specials. The times from Waterloo to Southampton were mainly from 1 hr. 45 min. to 1 hr. 50 min., and to Portsmouth 1 hr. 40 min. to 1 hr. 50 min. These times involved nothing extraordinary in the way of speeds, but they allowed drivers a few minutes margin to make up lost time, a provision which is essential when so many trains are running, one on the heels of each other. One thing that facilitated working into Southampton Docks was the recent opening of the approach line from Millbrook to the new ocean quay. We comment editorially on the actual carrying out of all these arrangements on page 93, where the complete success of all arrangements and personal experiences also are noted.

The German Railway Centenary

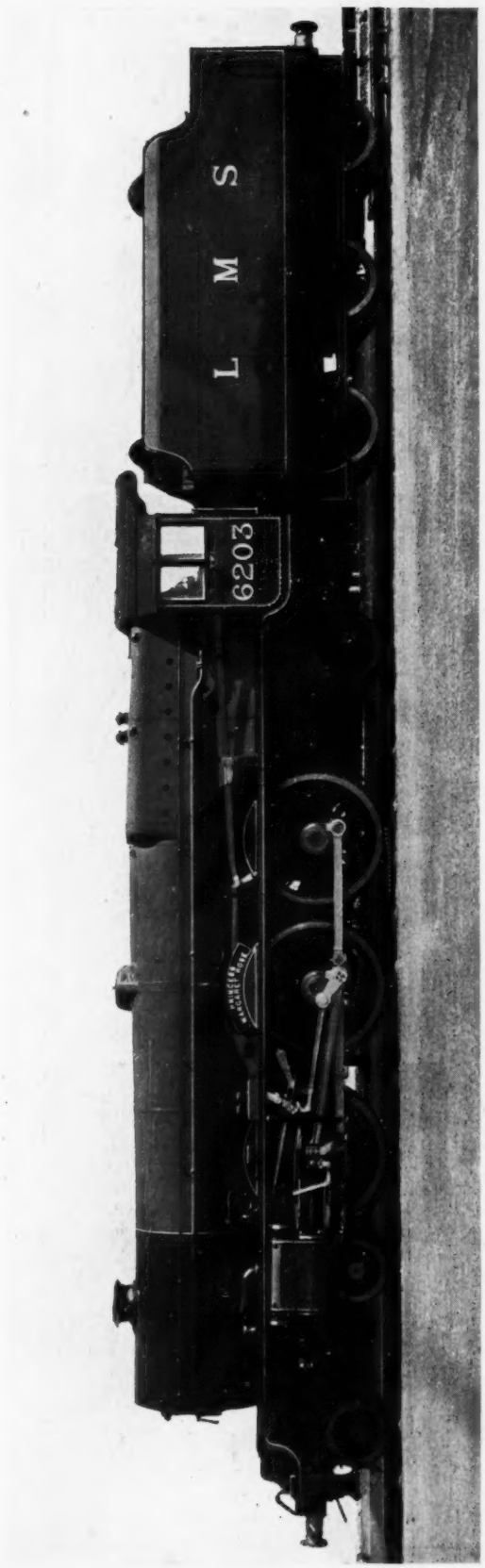
ON Sunday last, the Reich Minister of Communications, Baron von Eltz-Rübenach, opened the exhibition at Nuremberg, which is one of the chief features of the programme of events with which Germany is celebrating the hundredth anniversary of its railways. As we pointed out in an editorial note in our issue of March 29 last, the centenary of opening of the Nuremberg-Fürth line—the first steam railway in present day German territory—falls on December 7, which is too late in the year for adequate public ceremony.

This Reichsbahn exhibition is particularly happily situated at Nuremberg, as, apart from the town's historic association as one of the termini of the pioneer railway, it now possesses one of the largest and most modern of the German railway yards. More than one half of the total of 100,000 sq. metres of railway property attached to the Nuremberg depot is utilised for the exhibition, some 20,000 sq. metres being for the indoor and about 40,000 sq. metres for the outdoor sections.

The indoor exhibition begins with the Hall of Honour, to the memory of renowned pioneers of German railway building, and to leading railwaymen of the present day. Adjoining this hall are 12 booths containing pictures, diagrams, statistics, and documents covering the entire field of German railway technique, and demonstrating the important part played by the railway in the life of the nation. Interesting material connected with the early days of railroading gives the exhibition its centenary character, while modern railway methods and equipment are being shown in the form of models of the latest improvements in passenger and freight traffic, electric and diesel power, telegraph and automatic block signal systems.

The exhibition car shed contains examples of the many types of locomotive, carriage and wagon stock of the German State Railway, including high-speed electric locomotives, steam engines, and diesel railcars, glass roofed observation coaches, dining and sleeping cars, luggage and mail vans, and a new train for the Berlin Stadtbahn.

Generous acknowledgment is being given to the part played by Great Britain in early German railway development, and in his speech at the opening ceremony on Sunday, Dr. Dorpmüller, General Manager of the Reichsbahn, paid a special tribute to British assistance. It will be recalled that *Der Adler*, the original locomotive of the Ludwigsbahn (the Nuremberg-Fürth line), was built by Robert Stephenson & Company, which also supplied the first driver and mechanical engineer, William Wilson.



New 4-6-2 locomotive No. 6203 "Princess Margaret Rose," L.M.S.R.

NEW 4-6-2 EXPRESS LOCOMOTIVES, L.M.S.R.

The first of a new series of ten engines building at Crewe is now ready for traffic

AS already announced in these columns a further ten 4-6-2 express locomotives of the "Princess Royal" class are being constructed at the London Midland & Scottish Railway Company's Crewe Works. These are being numbered 6203-6212 inclusive, and the first of them, named *Princess Margaret Rose*, has just been put into service. The engines are generally similar to those built at Crewe in 1933, and fully described and illustrated in our issue of June 30, 1933, except for minor modifications suggested by the experience gained with their prototypes. They have four single-expansion cylinders measuring 16¼ in. diameter by 28 in. stroke, and steam is distributed to the cylinders by Walschaerts gearing, and 8 in. diam. piston valves having a 7¼ in. travel. In the new engines Hoffmann needle roller bearings are applied to the motion pins of the valve gear with the exception of the return crank bearings of the outside eccentric rods, which are fitted with S.K.F. double-row self-aligning radial ball bearings. The coupled wheels are 6 ft. 6 in. in diameter, the total weight of the engine in working order being 104 tons 10 cwt., of which 67 tons 10 cwt. are available for adhesion. These engines are fitted with steam operated sanding gear, whereas in the earlier ones the gear was worked by hand. The boiler carries a working pressure of 250 lb. per sq. in., and it is in the distribution of the heating and superheating surfaces that these engines differ from the earlier ones, as shown below.

	Engines 6200 and 6201	Engines 6203-6212
Firebox heating surface, sq. ft. ..	190	217
Tube ,, ,, ,, ..	2,523	2,097
Superheater, sq. ft.	370	653
Combined total ..	3,083	2,967

The grate area is 45 sq. ft. and the tractive effort, at 85 per cent. of the boiler pressure, 40,300 lb.

With a view to keeping down the weight of this large boiler as much as possible the barrel plates and firebox wrapper plates are made of 2 per cent. nickel steel, as in the case of the turbine locomotive recently illustrated and described in THE RAILWAY GAZETTE. Another point of resemblance to the turbine engine is the provision of a combustion chamber at the front of the firebox. The boiler is fed by a Davies & Metcalfe exhaust steam injector and a Gresham & Craven live steam injector, both delivering water to the boiler through top feed clack valves. The superheater elements are of the bifurcated type from single downcomers provided with spherical ball joints to the superheater header, and the number of flue tubes has been increased from 16 to 32. The regulator is incorporated with the superheater header casting inside the smokebox. These fittings are supplied by the Superheater Co. Ltd.

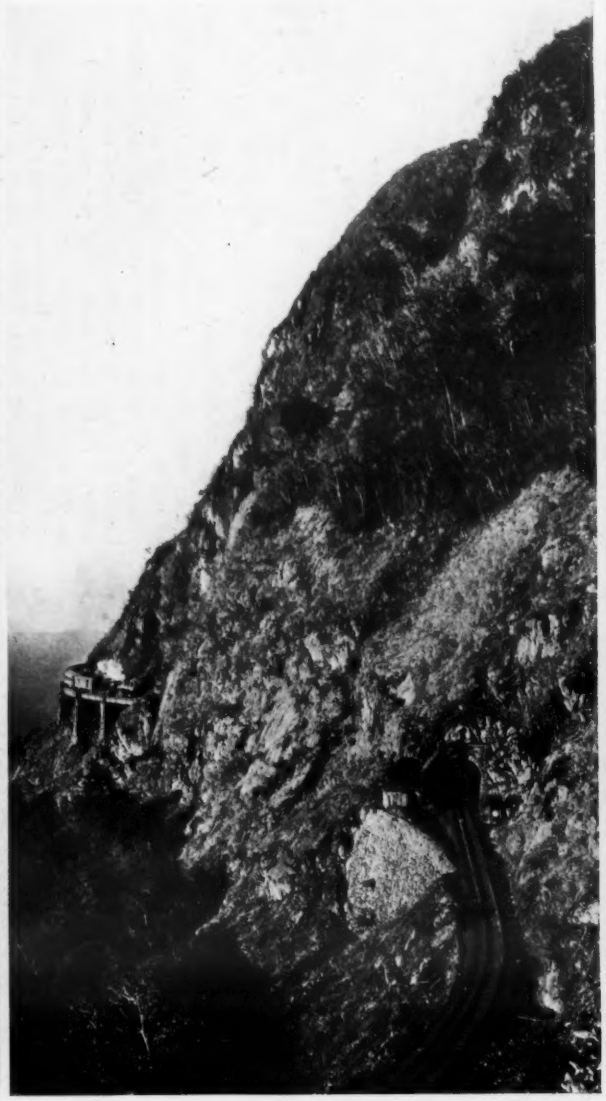
The main frames of the engine are 1⅛ in. thick and are of high tensile steel, whilst the coupling and connecting rods are of high tensile manganese molybdenum steel. In the case of five engines Hoffman roller bearings are fitted to the trailing bissel axlebox journals, whilst the remaining five have plain bearings. Grease gun lubrication is utilised wherever possible, as, for instance, the brake gear and intermediate buffing gear.

The tenders are larger than those fitted to the two earlier engines, the capacity being 4,000 gallons of water and 9 tons of coal. The weight of the engine and tender in working order is 159 tons 3 cwt.

XUM

THE PARANÁ RAILWAY, BRAZIL (*Described on page 122*)

Passenger train descending grade between km. 61-63. São João bridge in background



View giving a good idea of the extremely difficult country encountered by the construction engineers

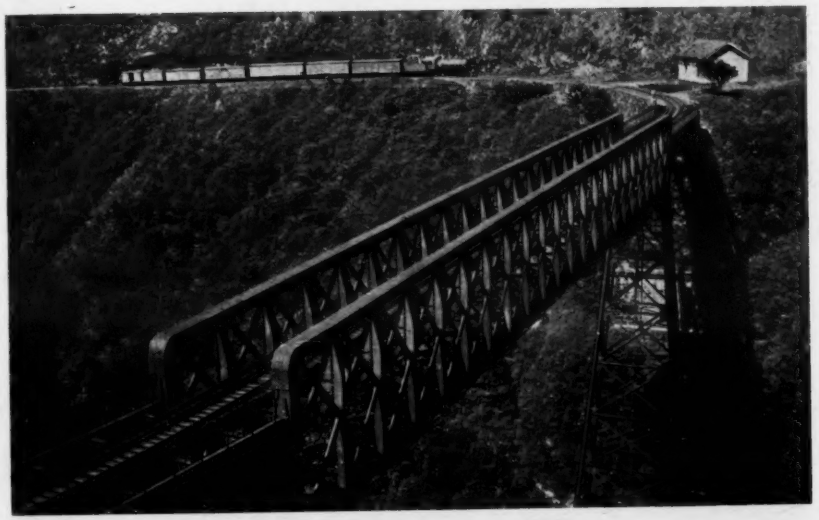
Presidente Carvalho viaduct built on precipitous side slope on maximum curvature

Mallet locomotive at head of goods train emerging from tunnel No. 13

Mineral train on typical section of line

Tunnel No. 12 cut through spur on precipitous hillside

Tunnel No. 3 : Note the loop and mountain peaks projecting from a sea of cloud in background



Goods train approaching São João bridge carried on steel trestle pier over deep ravine

TYPICAL VIEWS OF THE MOUNTAINOUS CHARACTER OF THE PARANÁ RAILWAY (See article on page 122)

IMPROVEMENTS AT DONCASTER WORKS, L.N.E.R.—III

Some further examples of the machines and methods employed in these old established shops. The previous article appeared in our issue of June 21

HEAVY duty radial drilling machines are freely used in a locomotive works and Fig. 4 shows an example of the latest practice in this class. The machine is a Kitchen & Wade 8-ft. heavy duty radial drilling, boring, tapping and trepanning machine, arranged to swing over an intershop runway, in addition to a movable work table on its own baseplate. The illustration shows the machine drilling the centre hole in a locomotive smokebox door, but this, of course, is only one of very many machining operations which it is capable of performing. Stacks of plates and other long articles, which are heavy enough to make it unnecessary to bolt them down for the machining operation, can be drilled and trepanned on this machine with every facility. The radial arm can be swung clear to allow of tender tanks, bunkers and other similar structural parts built up in the plating shop being transferred to the engine erecting shop, on the roller bearing trolleys provided for the purpose. Previously the tanks and other parts were loaded into wagons and shunted from shop to shop by the yard locomotive. In Fig. 5 is a near view of the same machine, showing the special de-speeding attachment, with which it is fitted for trepanning large holes, such as the opening for a locomotive cab window in the rear, or bunker, plate of the cab, as shown on the drilling machine table. This attachment can be used for cutting holes up to 30 in. in diameter and it performs its work in a rapid, accurate and simple manner.

A New Tool Room Lathe

In the tool room of these works there are to be found some excellent tools of modern design and installation, among them being a 17-in. swing high precision tool room lathe manufactured and supplied by John Lang & Sons Limited, of Johnstone, Scotland. This is equipped with an attachment for relieving milling cutters, taps, hobbing cutters, and dies, and Fig. 6 shows the operator striking the threads of a tap. The lathe has a cast-iron box bed upon which it may be levelled periodically by means of the levelling screws provided. This cast-iron bed is carried on the top of a monolith of concrete built up from a considerable depth and insulated from the shop floor by a surrounding cavity loosely filled with cinders and bridged with loosely fitting floor boards to preclude the

Fig. 4—Kitchen & Wade 8-ft. machine drilling hole in locomotive smokebox door

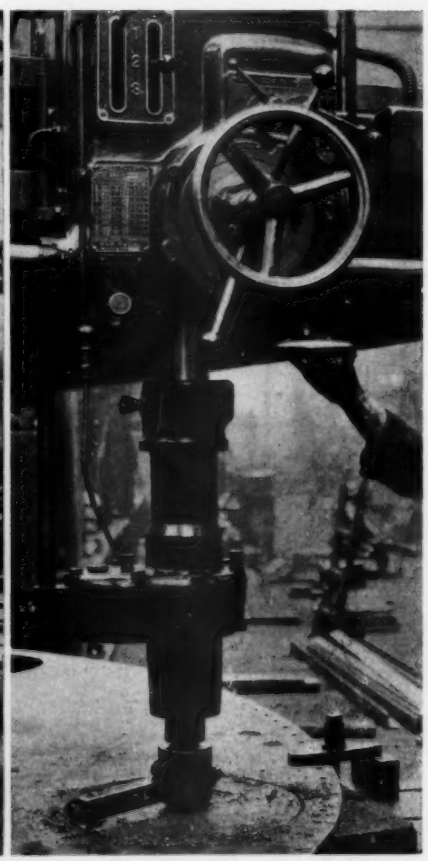


Fig. 5 Closer view of the machine cutting opening in cab plate for window

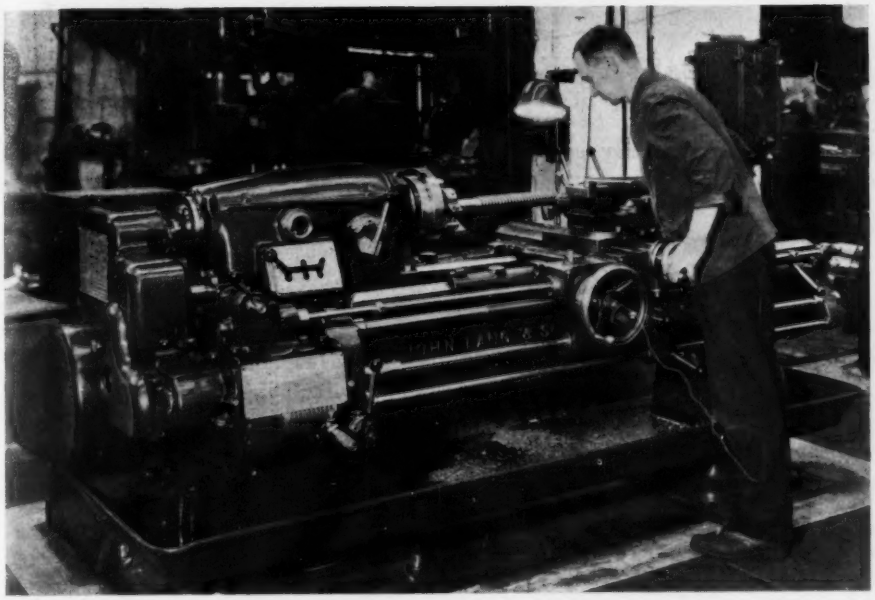


Fig. 6—Thread cutting operation on Lang toolroom lathe

transmission of vibration from the shop cranes and other machinery.

An interesting feature of this machine is the quick-change gearbox. With this ten changes are obtained by means of a rocker arm, and six further changes through the medium of levers, so that the total number of threads or feeds available is sixty. The gearbox is arranged to cut on the basis of threads per inch, millimetre, diametral, and module pitches, and also pitch in inches and odd threads as required. The main drive gearbox is arranged with six speed changes, these being obtained by sliding gears on castellated shafts, with ground castellations. The spindle speeds are changed by means of sliding gears and all gears in the drive are made of nickel-chrome heat treated steel with the gear tooth profile ground after heat treatment to remove distortion and ensure silent and smooth running. All gears throughout the main drive have also the teeth ground after cutting. The spindle speed controls consist of two levers at the front of the headstock, one having gate change giving six speed changes, whilst the other change is fast to slow, giving twelve spindle speeds in all; a direct reading plate is provided.

A Portable Oxygen Cutting Machine

Great strides have been made during the past few years in connection with the work of cutting and profiling of plates and other material and components used in railway shop practice, and the appliances used have made it possible to do away with a great deal of laborious hand work with a consequent economy in time and labour costs. The small machine shown in Fig. 7 is a portable straight line and circle cutting machine, supplied by the British Oxygen Co. Ltd., of London, and is used in the boiler and frame shops at Doncaster Works. The illustration shows a boiler wrapper plate being cut to shape subsequent to the operation of drilling on the flat, to which reference was made at the outset. The machine consists of an oxy-acetylene or oxy-coal gas blowpipe, possessing its own means of locomotion in the shape of a small variable speed motor. The cutting speed and oxygen pressures for various thicknesses are indicated on a plate attached to the top of the machine, and the correct speed of cutting is checked by a speedometer. The control of the machine is effected by push-button switches located in a position convenient to the handle at one end of the machine. Power is supplied by a universal motor suitable for 200-240 volts d.c. or a.c., single phase, 50 cycles, and the capacity of the machine covers straight lines to any length, circles of any diameter up to 15 in., and the cutting of steel plates up to 4 in. thick.

The machine may be guided through the medium of guide wheels running on a prepared template, as seen in the illustration, or, when cutting circles, by means of a radius bar. The blowpipe nozzle can be set so that bevels up to 45 deg. may be cut, suitable for welding, caulking, or fullering. The uniform speed gives a smooth cut which needs no subsequent machining, and reductions in the time taken to perform various operations vary from 60 to 80 per cent. as compared with those taken in performing similar work by the previous methods. This provides a convincing testimony to the efficacy of oxygen machine cutting and its advantages.

Our thanks are due to Mr. H. N. Gresley, Chief Mechanical Engineer of the London & North Eastern Railway, for the facilities accorded us to visit the works and examine the machines and processes, and in addition for the arrangements made for taking the photographs from which the accompanying illustrations have been reproduced.

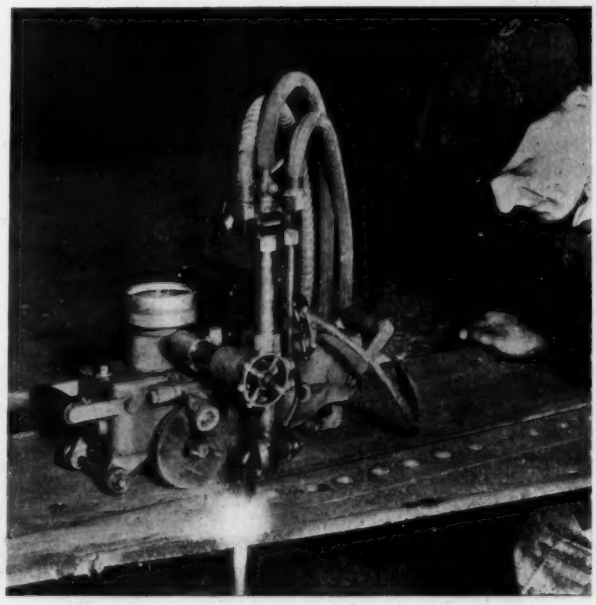


Fig. 7—Cutting plates by means of British Oxygen Company's portable straight line and cutting machine

XUM

LOCOMOTIVE BLAST-PIPE TRIALS IN INDIA

A 4-6-2 Indian Standard "XC" class engine has been fitted experimentally with the Kiesel front-end arrangement on the North Western Railway

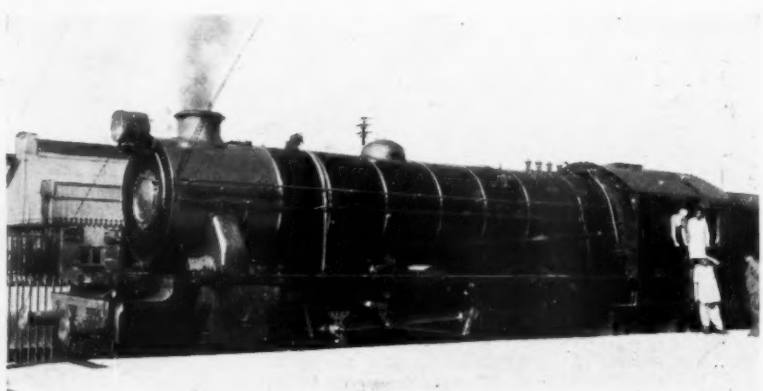
Karachi mail leaving Lahore—N.W.R. "XC" engine No. 1853 fitted with Kiesel blast pipe and enlarged chimney

CONSIDERABLE attention is now being paid in various countries to improved designs of locomotive front ends, and, from information received, by the courtesy of the Chief Mechanical Engineer of the North Western Railway (India), we learn that trials are at present being carried out on one of the standard two-cylinder heavy Pacific "XC" class engines of that line with a Kiesel blast pipe.

The Kiesel, or Sweeney, blast pipe is best known in America, where it has been fitted to large freight engines with successful results. The orifice, shaped like a star, with the points opened out like the arms of a Maltese cross, is designed to increase the periphery of the blast orifice. It is claimed that the fitting of this form of blast pipe will make possible an increase in the train tonnage which can be dealt with by any particular engine.

The fact that the Indian trial is being made on an express passenger engine employed on the Karachi-Lahore mail service, where the trailing load is generally about 530 tons, is of special interest, as the application of this type of blast pipe does not appear to have been tried before on a passenger engine. It may be noted that the photograph from which the upper illustration has been prepared was taken only a few hundred yards from where the train had started and shows the wide dissipation of the exhaust, which is also muffled.

As illustrative of American experience with the Kiesel front end arrangement, it is interesting to recall some tests carried out on the Wabash Railway with a locomotive of the 4-8-2 type. The results proved that from 25 to 30 per cent. more power could be obtained after the alteration had been brought into use. The locomotive then tested had two cylinders measuring 27 in. by 32 in. and carried a steam pressure of 245 lb. per sq. in.; the diameter of the coupled wheels was 5 ft. 10 in. and tractive power 69,400 lb. This locomotive after being equipped with the Kiesel front end developed a maximum indicated horsepower of 4,931. There was a decrease in back pressure and an increase in the temperature of superheat, so that an improvement in steam economy and decreased fuel consumption might be said to have resulted from the alteration. The exhaust nozzle used for the tests was of the six-ported star shaped pattern having an area of 53·1 sq. in., and the chimney of the engine was enlarged to 25½ in. diameter. Hulson tuyere type grates with 14·9 per cent. air opening were used.



N.W.R. "XC" Pacific engine fitted with Kiesel blast pipe

RAILWAY NEWS SECTION

PERSONAL

Mr. C. R. S. Harris, M.A., who, as announced in THE RAILWAY GAZETTE of March 29, was then appointed a Local Director of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, assumed the title of Director General of both systems, on arrival in Argentina on July 5.

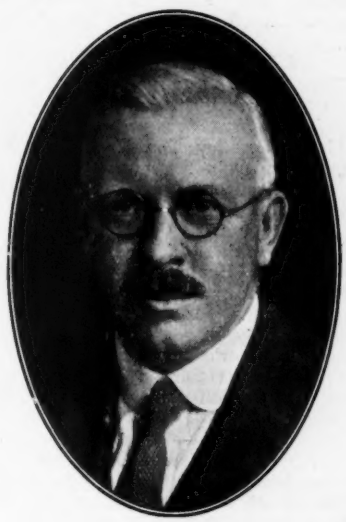
We regret to record the sudden death, on July 14, of Mr. J. P. Scott Main, O.B.E., M.I.Mech.E., M.Inst.T., Assistant to the Chief Inspecting Officer of Railways, Ministry of Transport. Mr. Main, who was 64, served an apprenticeship in the locomotive workshops of the Glasgow & South Western Railway from 1887 onwards, and after five years took up locomotive running work on the Manchester, Sheffield & Lincolnshire Railway. He was subsequently appointed Outdoor Locomotive, Carriage and Wagon Superintendent of the Western Australian Government Railways. In 1901, Mr. Main joined the Board of Trade Railway Inspection Department, as one of the first two Assistant Inspecting Officers of Railways to be appointed under the Railway Employment (Prevention of Accidents) Act of 1900. He was appointed Assistant to the Chief Inspecting Officer of Railways in May, 1918. He served as Secretary from its inception, and as member from 1925, of the Railway Employment Safety Appliances Committee, set up by the Board of Trade in 1906 to examine and test appliances designed to diminish danger to men employed in railway services. During the war he served as Secretary to the Traffic Diversion Committee (East to West Coast) appointed by the Board of Trade. In 1917 Mr. Main was appointed Secretary and member of the Railway Employment of Disabled Soldiers and Sailors Committee. He was also a member of the Executive Committee of the National Safety First Association. It was in December, 1932, that Mr. Main was awarded the O.B.E.

The late Mr. J. P. Scott Main, O.B.E.,

Assistant to the Chief Inspecting Officer, Ministry of Transport, 1918-35

Mr. P. J. Smith,

Rates Assistant to the Chief Goods Manager, G.W.R., 1933-35



Mr. S. H. Creebo,

Appointed Rates Assistant to the Chief Goods Manager, G.W.R.

Mr. Percy John Smith, who, as announced in our issue of July 12, has retired from the position of Rates Assistant to the Chief Goods Manager, G.W.R., due to failing health, joined the railway in 1894, and has subsequently served continuously in the Rates office, except for two periods spent with the Royal Air Force and on loan to the Piræus, Athens & Peloponnesus Railway in Greece. On the latter occasion he reported upon the methods of merchandise charging upon that system. On his return to the G.W.R., in 1930, he acted as Assistant to the Assistant Goods Manager, Rates until his appointment in July, 1933, as Rates Assistant to the Chief Goods Manager.

Mr. S. H. Creebo, who, as announced in THE RAILWAY GAZETTE of July 12, has been appointed Rates Assistant to the Chief Goods Manager, G.W.R., began his service with that railway in the Rates Department of the Chief Goods Manager's office in 1898, and, apart from two years' service with the Royal Engineers (Light Railways) in Northern France, has been in the same department for the whole of his service. After experience on most of the rates sections of the Department, he was appointed in 1929 to the charge of the section dealing with the Rates Tribunal, Ministry of Transport, and other kindred matters, and, in 1930, was promoted to one of the four supervisory posts in the Rates Department. In January, 1934, upon the retirement of the then Chief General Clerk of that department, Mr. Creebo was appointed to fill this post which he now relinquishes upon appointment as Rates Assistant to the Chief Goods Manager.

We regret to learn of the recent death of Mr. W. S. Eyre, Deputy Chairman of the Peruvian Corporation Limited, and a Director of both the Chilian Transandine and Nitrate Railways. Joining the South American branch of the firm of W. R. Grace & Company of New York, he was largely responsible, with Mr. M. P. Grace, for the formation of the Peruvian Corporation. A requiem mass for Mr. Eyre was held on July 10 at the Church of the Immaculate Conception, Farm Street, W., and among those present were:—Mr. Oliver Bury, Sir Murrough Wilson, Mr. A. W. Bolden and Lt.-Col. F. C. C. Balfour.

We regret to record the recent death, in New York, of Mr. John Fairman,

XUM

who was for many years associated with the representation of the London & North Western and London Midland & Scottish Railways in the United States. Mr. Fairman, who was 71 years of age, joined the L.N.W.R. in the Goods Department at Winslow (Bucks) in 1881, and after varied experience was transferred to the Chief Goods Manager's Office, Euston, in 1892. Six years later, Mr. Fairman went to New York in connection with the American representation of the company, being subsequently appointed American Representative in 1918. Upon the amalgamation in 1923, he became L.M.S.R. Passenger and Freight Agent, New York, and was appointed American Agent, New York, a year later. He retired in February, 1929, after 48 years' service, and since his retirement had continued to reside in New York.

L.M.S.R. Appointments

The following appointments have been approved by the directors:—

Chief Operating Manager's Department

Mr. E. Crossley, District Locomotive Superintendent's Assistant, Bletchley, to be District Locomotive Superintendent, Edge Hill.

Scottish Changes

Mr. W. Hain, Chief Foreman, Chief Mechanical Engineer's Department, Inverness, to be District Locomotive Superintendent, Inverness, and to be also in charge of the Chief Mechanical Engineer's workshops, Inverness.

Mr. W. H. Hamilton, Goods Agent, Falkirk (Grahamston) to be Goods Agent, Govan.

Mr. Edward Moore, Chief Solicitor of the former Great Eastern Railway, whose death we recorded on June 7, left estate of £59,983 (£59,860 net).

We regret to record the death, on July 16, of Mr. Alexander Muirhead, C.I.E., Chairman and Managing Director of the South Indian Railway, in his 76th year.

New L.M.S.R. Queen's Hotel, Leeds

Contracts have now been placed by the L.M.S.R. for its new Queen's Hotel at Leeds, and work will be begun during the second week in August. The present building is to be completely demolished, and it will be approximately two years before the new hotel is ready, but the L.M.S.R. announces that hotel and catering facilities will be maintained throughout the transition period.

Over 50,000 tons of material will be required in the construction of the hotel, which will contain 200 bedrooms, each with a telephone and private bath. Among the features of the new building will be 5 miles of heating pipes, circulating 10,000 gallons of water hourly; 14 lifts, including high-speed passenger elevators running at 450 ft. a min.; and an electric chute to convey linen from all of the eight upper floors down to the linen room.

The building exterior (of which we publish an artist's impression) will be of Portland stone, planned on architectural lines of dignity and restraint in keeping with its important position in Leeds City Square. From the square the main entrance will lead into an entrance hall 80 ft. long and 20 ft. wide. Catering facilities will comprise a grill room accommodating between 200 and 300 persons; a French restaurant; two banqueting halls accommodating respectively 600 and 150; and a basement brasserie for 200.

In addition to kitchens, stores, a bakehouse, and a printing shop, the basement will contain an engine room containing heating boilers, ventilating plant, vacuum cleaning plant, and the electrical switchroom. The ventilating fans will pass about 8,000,000 cu. ft. of air an hour through the fresh air plant, and this will circulate to every room in the hotel.

The building will be of fire-resisting construction throughout, and will be fully equipped with fire mains, with connections to hydrant and hose-pipe stations on each floor. As recorded in our Contracts and Tenders columns, the general building contractors will be William Airey & Son (Leeds) Ltd.; the steelwork contractor, Redpath, Brown & Co. Ltd., and the heating, ventilating and hot and cold water service contractor, C. N. Haden & Sons Limited. The architects are Mr. W. Curtis Green, R.A., and the L.M.S.R. architect, Mr. William H. Hamlyn, F.R.I.B.A.; the engineer for steelwork and foundations, Mr. B. L. Hurst, M.Inst.C.E.; and the engineer for heating, ventilating, wated, &c., services, Mr. Oscar Faber, O.B.E., D.Sc., M.Inst.C.E.

New Zealand Government Railways railcar fitted with turntable jacking arrangement, in which the Governor-General, Lord Galway, recently visited the Tawa Flat deviation works. *See page* 101

Ketton L.M.S.R. Station Re-named.—Ketton station, on the L.M.S.R. Market Harborough–Stamford - Peterborough line, has been re-named Ketton and Collyweston.

Railway Students' Association Annual Convention

Last week-end the Railway Students' Association of the London School of Economics held its annual convention at the Chancellors Hall, Birmingham University, from July 11-15. The party, which numbered about 40, left Paddington on Thursday evening, and on arriving at Snow Hill station inspected there the layout and signalling arrangements. Visits were also paid to the district goods control office and parcels office.

The following morning the proceedings were opened with an address of welcome on behalf of the transport undertakings of Birmingham and district given by Mr. W. E. Hart, Divisional Superintendent, G.W.R., Birmingham. A paper was then given by Prof. P. Sargant Florence, of Birmingham University, on the subject of "The cost of small scale distribution." Sir William Beveridge, Director of the London School of Economics and President of the Association, presided. The paper, which dealt more with retailing than transport, nevertheless provided the basis for a good general discussion. In the afternoon a visit was paid to the works of the Austin Motor Company, where two hours were spent in seeing every phase of modern large scale motorcar manufacture. Following this, a Mayoral reception was given by the Lord Mayor of Birmingham, Alderman J. S. Grey, and the Lady Mayoress, at the Council House, where tea was taken. In the course of a short speech the Lord Mayor pointed out that the association had chosen as the venue of its convention what was probably the most prosperous city in the country; the present unemployment figures were actually below those of the pre-war years. Later the party was divided, and members inspected either the L.M.S.R. Curzon Street goods depôt or the G.W.R. Moore Street goods depôt.

On Saturday morning Sir Herbert Austin read a paper on "The future of road transport," and Mr. F. K. Pelley, District Goods Manager, G.W.R., Birmingham, presided. Sir Herbert's description of the future was decidedly visionary, and following the discussion Sir Herbert found himself with many points to answer concerning his dramatic suggestions for roads of the future. After lunch the party travelled from Snow Hill to Hatton in one of the new G.W.R. buffet streamlined diesel railcars. At Hatton an inspection was made of the new canal locks recently installed by the Grand Union Canal Company.

Sunday was spent in an all-day motor coach tour of the Shakespeare country, Coventry, Kenilworth, Guy's Cliff, Warwick, Leamington, and Stratford-on-Avon being visited. On the return journey a detour was made via the impressive Bournville estate.

"Railways and distribution" was the subject of the final paper delivered on Monday morning by Mr. F. K. Pelley. Mr. C. E. R. Sherington, Secretary, Railway Research Service, presided. A lively discussion followed the reading of this paper, and much attention was devoted to the question of rates and their basis of assessment. The theory of "what the traffic will bear" in particular received considerable criticism. In the afternoon the party travelled from New Street to Stoke Works, near Droitwich, where an inspection was made of the works of the Salt Union Limited. The journey had the interest of including the descent of the Lickey incline. Tea was taken at the invitation of Salt Union Limited at the company's works. Later the return to London was made via Worcester.

Mr. A. F. Wallis, the Honorary Secretary of the association, and his committee are to be congratulated on the success of the convention, at which among those present were:—Messrs. E. D. Brant, J. F. Brook, J. O. Ellis, W. E. Hart, A. R. Marshall, G. J. Ponsonby, S. Roberts, and J. B. Scattergood.

Special Meeting of I.R.C.A. Permanent Commission

The Permanent Commission of the International Railway Congress Association met in Brussels from July 4 to 7 and, owing to the fact that the association was celebrating the 50th anniversary of its foundation, special importance was attached to the meetings. In addition to the actual members of the Permanent Commission, a good number of engineers and other railway officials also attended and took part in the discussions on two questions of immediate interest to railways, which the congress had had under consideration since the last Session. The first of these questions concerned the construction of railcars, and the second, the world crisis and its effects on the working of the railways in all parts of the world.

About 100 delegates in all, from various countries, attended, and included the General Managers of most of the French railways, Dr. Dorpmüller of the German Reichsbahn, and representatives from Italy, Spain, Portugal, Switzerland, Jugoslavia, Czechoslovakia, Roumania, &c., in addition to the British delegates. Among the last named were Lord Rockley, Director of the Southern Railway; Mr. Douglas Vickers, Director of the L.M.S.R.; Sir Ralph Wedgwood, Chief General Manager, L.N.E.R.; Mr. H. N. Gresley, Chief Mechanical Engineer, L.N.E.R.; Mr. W. A. Stanier, Chief Mechanical Engineer, L.M.S.R.; Mr C. E. Fairburn, Chief Electrical Engineer, L.M.S.R., and other high officials of both the mechanical and commercial departments of the British railways.

Very interesting discussions took place and, as a result, a series of conclusions was drawn up with regard to both subjects.

After the meetings the members attended an official dinner given in the historical Palais d'Egmont in Brussels, at which many celebrities—including several former Belgian Ministers of Railways—were present.

On July 7 a trip was organised from Antwerp to Ostend by the latest addition to the fleet of the Dover-Ostend mail steamers, the ss. *Prince Baudouin*. The guests were afterwards received by the civic authorities of Ostend, and spent a pleasant evening at the Casino-Kursaal, finally returning to Brussels by a special train drawn by one of the latest Pacific locomotives of the Belgian National Railways, which easily accomplished the journey in 77 minutes. The Permanent Commission, at the meeting of July 4, decided to hold the next Congress (13th session) in Paris in 1937.

Sale of the Ottoman Railway

In view of numerous inquiries, the Ottoman Railway from Smyrna to Aidin has issued the following explanatory statement regarding the sale of its line to the Turkish Government:—

The sale agreement, dated May 1, 1935, having been duly ratified by the Turkish Government and the company's shareholders and stockholders, all formalities in this connection have now been complied with. The railway was actually handed over to the Turkish Government on July 1, having been worked for account of the Government as from June 1.

The scheme of arrangement has been approved by the company's shareholders and stockholders and sanctioned by the Court, but will not become operative until the £1,825,840 7½ per cent. Turkish Debt bonds, 1935, forming the consideration for the sale are deposited with the Ottoman Bank in London. The date fixed by the sale agreement for such deposit is September 30, 1935.

As soon as reasonably practicable after the receipt of the above bonds the company will give due notice to its stockholders and shareholders regarding the surrender of their certificates against payment and delivery to them of the cash, securities and shares which under the scheme they are to receive in full satisfaction of the principal of their holdings, and, in the case of the stockholders, of all interest accrued thereon subsequent to December 31, 1934. Interest on the Turkish bonds and the new income debenture stock will accrue as from June 1, 1935.

A brief account of the history and development of this line was given on pages 1073–4 of our issue of May 31 last.

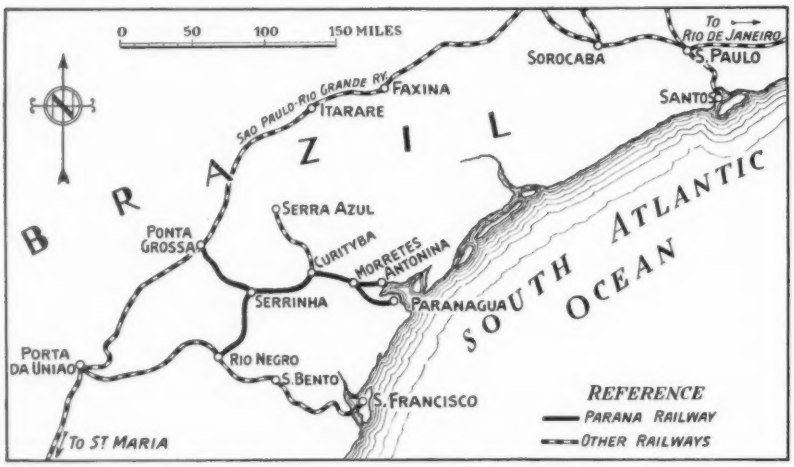
XUM

Jubilee of the Paraná Railway, Brazil

A brief history of the line and description of the heavy engineering works entailed in its construction

(*See illustrations on pages* 114 & 115)

The Companhia Estrada de Ferro do Paraná was formed in April, 1874, with the object of linking up the port of Paranaguá with the town of Morretes (a distance of 25 km.), the then Province of Paraná undertaking to guarantee interest of 7 per cent. per annum on the issued capital of 2,000 contos. By Decree passed in May, 1875, the Imperial Government of Brazil, wishing to establish rail communication between Paranaguá and Curityba, a distance of 110 km., guaranteed in its turn the interest on the original capital and at the same time increased the latter to 5,000 contos, on the understanding that the construction should be extended from Morretes to Curityba.



Map showing the position of the Paraná Railway of Brazil relative to other lines and to the seaboard

By Decree passed in August, 1879, the original concessionaires for the construction as far as Morretes were authorised to transfer all rights and obligations to the Compagnie Générale de Chemins de Fer Brésiliens, the capital value of the concern then being fixed definitely at fr. 32,500,000, or, at the prevailing rate of exchange (27d. to the milreis), 11,492 contos. The Compagnie Générale began the construction from Paranaguá to Morretes in June, 1880, and the line was opened in November, 1883. The final stretch, from Morretes to Curityba, was constructed under the supervision of the Brazilian engineer, Dr. Teixeira Soares, and opened on February 5, 1885.

The various Governments of Brazil authorised, by Decrees passed between that date and March, 1898, the further extension of the main line from Curityba to Ponta Grossa (linking up there with the São Paulo-Rio Grande Railway), and the construction of branches from Serrinha to Rio Negro and from Morretes to Antonina, until finally the Paraná Railway operated 354 km. of line. In 1902 the Government decided to buy up the railway from the Compagnie Générale, taking it over in March, 1903, and remaining in possession until November, 1904, when the Paraná Railway was leased under contract to the engineer, Carlos Trojd Westermann. By Decree passed in March, 1910, the lessee was authorised to transfer the contract to the São Paulo-Rio Grande Railway, which administered and operated the concern from then until the end of 1930, when the Government, following on the revolution which deposed President Washington Luiz, took over the entire system, including the leased Paraná Railway, and has since administered and operated it.

The most difficult and hazardous part of the construction of the Paraná Railway was that between Morretes and Curityba, involving engineering work of an unprecedented nature, and it was in honour of Dr. Teixeira Soares, who, employing national labour exclusively, was responsible, after the failure of Italian engineers, for the completion of this section of the line, that a festival, attended by members of the famous engineer's family, high Government officials, and representatives of the principal Brazilian railways, was held in Curityba on February 5, 1935, to commemorate the fiftieth anniversary of this notable feat.

The line starts from Paranagua at an altitude of only 5 m. above sea level, and the first 41 km. to Morretas are comparatively level, with a ruling gradient of 1 in 100 and no curve sharper than 200 m. radius. At Morretes, however, the steep climb over the second section to Roca Nova (Km. 80) begins. The summit level at Roca Nova is 955 m. and is reached only by resorting to 1 in 27 gradients and 70-m. radius curves in this 39-km. mountain section of very difficult engineering work.

The final 30-km. section of line from Roca Nova to Curityba traverses plateau country with nothing more severe than 1 in 59 gradients and 98-m. curves. In order to traverse the 69 km. between Morretes and Curityba, consisting mainly of precipitous mountains covered with luxuriant vegetation cut up by deep ravines, it was necessary to build 41 large bridges and viaducts, with a total length of 980 m. (2,919 ft.); 30 smaller bridges and culverts having a total waterway of 62 m.; 101 retaining walls; and 15 tunnels, totalling 1,690 m. (5,543 ft.) in length. The longest is Roça Nova tunnel, 429 m. in length, of which 135 are lined. The São João viaduct is 110 m. (361 ft.) long and 58 m. (190 ft.) high, and the Grota Funda viaduct, at km. 64, has a span of 60 m. and is supported on two iron piers; which in turn rest on masonry piers, the total height is 45 m. (148 ft.). Close to the Pico do Diabo, km. 65 there are four tunnels and five viaducts.

At the present time a busy passenger and freight traffic is operated, entirely by adhesion, over the 110 km. between Paranaguá and Curityba. The fastest passenger train is booked to cover this distance in 3¼ hr., at an average speed, inclusive of three intermediate stops, of nearly 34 k.p.h., which is considered good, considering the nature of the route. The heavier freight trains are hauled by Mallet compound locomotives, having 60 tons adhesion weight, and may be seen at work in two or three of our illustrations of this interesting railway on pages 114 and 115.

European Air Services

Writing in *The Manchester Guardian* M. Henri Bouché, who as rapporteur of the Air Transport Co-operation Committee of the League of Nations, was the author of the report on the "Economics of Air Transport in Europe" reviewed in THE RAILWAY GAZETTE for June 28 last, says:—"The total transport effected in a year by commercial aviation in Europe would be equalled by sending daily from London to Manchester and back a single train of seven or eight 10-ton trucks. To obtain this result, 600 pilots and 500 aeroplanes are employed at a cost of fr. 420,000,000 (£5,500,000 at present rate of exchange) in direct subsidies and at least fr. 150,000,000 (£2,000,000) more in other State contributions. An hour and a quarter of flying is done daily on the average by each pilot and aeroplane, with total receipts of fr. 2,750 (£37) an hour, of which fr. 2,100 (£28) comes from the State and fr. 650 (£9) from customers."

London Electric Transport Finance Corporation

(*See editorial article on page* 96)

By an agreement dated June 20, 1935, between the Treasury and the London Passenger Transport Board, the G.W.R., and the L.N.E.R. (collectively called the transport undertakers), it was provided that a company should be incorporated for raising and lending to the transport undertakers sums not exceeding in the aggregate £40,000,000 to be raised by the issue of securities of the company and that a Bill should be submitted to Parliament conferring on the Treasury the necessary powers to enable the Treasury to guarantee the payment of the principal of and interest on such securities. A Bill was accordingly submitted to Parliament and was passed into law on July 10 as the London Passenger Transport (Agreement) Act, 1935, as recorded on page 72 of last week's issue of THE RAILWAY GAZETTE. The scheme of electrification and new works envisaged by these arrangements was set out on pages 1133 and 1134 of our issue of June 7.

A company was accordingly incorporated on July 10 under the title of the London Electric Transport Finance Corporation Limited, and by an agreement dated July 11 between the company and the transport undertakers, the latter have agreed, subject to their obtaining the necessary statutory powers, to borrow such moneys from the company in the proportions of L.P.T.B. 70 per cent., L.N.E.R. 25 per cent., and G.W.R. 5 per cent.

The directors of the new company are Messrs. Walter Kennedy Whigham, Chairman (a Director of the L.N.E.R., of the Bank of England, and of the finance house of Robert Fleming & Co.); Patrick Ashley Cooper (a Member of the L.P.T.B., a Director of the Bank of England, and Governor of the Hudson Bay Company); Edward Holland-Martin (a Director of the Bank of England); and Kenneth Oswald Peppiatt (Chief Cashier of the Bank of England).

The Articles of Association of the company provide (*inter alia*) that a director need not be a shareholder; that the directors shall not be entitled to any remuneration for their services, but they shall be entitled to be repaid such reasonable travelling, hotel and other expenses as they may incur in going to, attending and returning from meetings of the board or of committees of the board or general meetings, or which they may otherwise incur in or about the business of the company; and that any director who performs special services beyond the ordinary duties of a director may be paid such remuneration by way of salary, or otherwise as the board may determine, which shall be charged as part of the company's ordinary working expenses.

Registered offices of the company are at 5, London Wall Buildings, E.C.2, and the Secretary is Mr. John A. Roney.

Share capital authorised and issued is 100 ordinary shares of £1 each, fully paid. For an issue of £32,000,000 of 2½ per cent. guaranteed debenture stock lists were opened on Wednesday, and the Governor and Company of the Bank of England authorised to receive applications. This stock, which is guaranteed as to principal and interest by His Majesty's Treasury under the provisions of the London Passenger Transport (Agreement) Act, 1935, bears interest payable half-yearly at the Bank of England on February 1 and August 1. A first payment of 11s. per £100 stock will be made on February 1, 1936. The stock is an investment authorised by the Trustee Act, 1925, for the investment of trust funds. It was issued at 97 per cent., of which 5 per cent. was payable on application; 12 on July 30; 15 each on September 12, November 1, and December 19; and 35 on January 20, 1936.

The stock is secured by a trust deed dated July 11 in favour of Royal Exchange Assurance containing the guarantee of the Treasury for the payment of principal and interest and providing that the company may, with the consent of the Treasury, issue at such rate of interest and on such terms as may be determined at the time of the issue, further stock up to an amount sufficient with the amount now issued to raise a total sum not exceeding £40,000,000. If not previously redeemed, the stock will be repaid at par at the Bank of England on August 1, 1955; but the company reserves the right, on giving three months' notice in *The Times*, to redeem the whole or any part (not being less than a nominal amount of £500,000) at par on August 1, 1950, or on any half-yearly interest date thereafter. In cases of partial redemptions the part to be redeemed will be determined by purchase or tender at or below par, exclusive of accrued interest, or by drawings at par.

As was to be anticipated with a Government-guaranteed issue, it appealed to the banks and large insurance companies and the lists were announced to be closed (fully subscribed) 65 minutes after opening. Dealings were expected to begin yesterday.

RAILWAY AND OTHER MEETINGS

GREAT WESTERN OF BRAZIL RAILWAY CO. LTD.

The ordinary general meeting of the Great Western of Brazil Railway Co. Ltd. was held at River Plate House, Finsbury Circus, E.C.4, on July 17, Mr. G. H. Harrisson, C.M.G., M.Inst.C.E. (Chairman of the company) presiding.

Mr. A. J. Medlycott (Secretary) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, first paid a tribute to the memory of Mr. H. C. Allen, a Director of the company for 24 years, whose death had occurred since the last meeting. The loss of his great personality was deplored by all.

Reviewing the year's results, the Chairman pointed out that, although the debenture interest had been earned in full, nothing had been earned on the share capital, nor could any sum be set aside for its amortisation. Interviews with the Brazilian Government regarding the critical situation of the railway had been proceeding, and were a reason why the meeting was being held later than usual, but political events had so far deferred any conclusion to these negotiations. The company suffered chiefly from being obliged to meet its obligations in Milreis, the value of which was now 2 1/16d. compared with 4d. a year ago and 1s. 4d. prior to 1914. It was therefore impossible to keep the line at the high standard required by the importance of its traffic.

Necessary repairs to bridges and permanent way could not be carried out, with consequent limitations upon the size of power units which could be used on certain sections of the railway. The new Brazilian constitution of 1934, however, recognised the right of public utility concerns to receive a remuneration sufficient to ensure adequate service, and also relieved the railways of the obligation of collecting a tax on passengers and goods in transit.

The railway had decided to instal water-softening plants throughout its Northern and Central sections as soon as possible, thereby making possible the use of steel instead of copper boiler tubes and reducing the frequency of withdrawals and repairs. Some passenger traffic had been regained by fare reductions, but the hoped for co-ordination of transport was still unrealised. Reports on current conditions in Brazil suggested a volume of potential traffic in 1935 which the railway in its present state would be unable to handle adequately, and he (the Chairman), hoped the Brazilian Government would recognise the anomaly of a vital transport organisation being unable either to profit from or enhance the country's reviving prosperity.

The report and accounts were unanimously adopted.

(*See editorial note on page* 94)

XUM

NOTES AND NEWS

Waterloo Station, Southern Railway.—From July 7, the Eastern Section station at Waterloo has been named Waterloo, instead of Waterloo Junction as formerly.

L.M.S.R. Bill.—The London Midland & Scottish Railway Bill, which was reported with amendments on July 9 from the Unopposed Bills Committee of that House, was read a third time in the Lords on July 15, with the amendments, and passed and returned to the Commons.

Closing of Singleton Branch, Southern Railway.—The passenger service on the Chichester-Midhurst branch of the Southern Railway ceased with the introduction of the summer timetables on July 7. Goods traffic will continue to be dealt with at Singleton, Lavant, and Cocking, the intermediate stations on the line.

The "Mowatt" Challenge Cup Competition, 1935.—The final cricket match for the challenge cup presented by the late Rt. Hon. Sir Francis Mowatt, G.C.B., was played on the L.N.E.R. (Great Northern Section) Athletic Ground at Gordon Hill on July 11, when a team from the Engineer's Department beat a team representing the "other" departments by 58 runs for 1 wicket to 53 runs.

Transport in Northern Ireland.—The Road and Railway Transport Bill (Northern Ireland) has received the Royal Assent, and will come into operation on September 1. The measure establishes a Road Transport Board which will take over and operate the great majority of road transport undertakings in Northern Ireland, including those of the railway companies. It also provides for co-ordination of the services of the board and of the railway companies.

Grantham Loco. Depot Improvement Scheme.—Major improvements are to be effected to the important L.N.E.R. locomotive depot at Grantham on the main line between King's Cross and Scotland. Some 64 engines are stationed at Grantham to serve express trains between King's Cross and the North in addition to branch services in Lincolnshire and Nottinghamshire, and nearly 1,000 tons of coal is used every week at this depot. Locomotives are at present coaled from a single-sided elevated tip stage; this is to be replaced by a modern bunker type concrete coaling plant with ground level wagon tippler and skip hoist, the bunker being fitted with improved anti-breakage devices. An engine pit 150 ft. long is to be provided on an existing siding, and a new siding and engine pit 100 ft. long are to be constructed. The existing pit under the sheer legs is to be deepened to 3 ft. and the siding lengthened to accommodate a second engine. A modern sand-drying plant is to be installed in a new building adjacent to the engine pits and electric light is to be provided in proximity to the coaling plant and engine pits.

New Southern Suburban Station.—On July 7 the Southern Railway opened a new station called Albany Park between Sidcup and Bexley on the electrified London suburban line to Dartford.

Entre Rios Railways Debenture Interest.—Holders of the 5 per cent. and 4 per cent. debenture stocks of the Entre Rios Railways Company have agreed to a further postponement of interest until July 1, 1936, or, subject to consent of the special committee, till July 1, 1937.

Southampton Central Station, Southern Railway.—With the reconstruction of Southampton West station, the name has been changed to Southampton Central, as from July 7. The new spur line giving access to the docks extension from Millbrook has also been brought into use, and the line between Southampton Central and Millbrook quadrupled. Millbrook station has also been rebuilt.

French Fruit Exporters Visit England.—On Sunday evening last, July 14, a delegation of fruit and vegetable exporters from the districts served by the P.L.M. Railway arrived at Victoria station, London. In the early part of the week the members were accompanied by L.N.E.R. and Southern Railway representatives and also by the London agents of the P.L.M. and Nord Railways on a visit to Bishopsgate goods station, Gravel Lane goods station and Covent Garden market, where they were afforded opportunities for examining the unloading facilities for fruit and vegetables arriving from the Continent via the Harwich train ferry and also via the Southern Railway Boulogne route. In addition, the party was received by various trade organisations in London.

L.M.S.R. "Punctuality Day" Test.—The L.M.S.R. has announced the results of a special 24-hours test, which concluded at midnight of July 10-11, of the timekeeping of every passenger train throughout the system in England, Scotland and Wales. The test, which covered over 14,000 express, steam local, and electric passenger trains, showed that 98·2 per cent. punctuality was achieved for the whole of the line. This is regarded as a highly satisfactory result in view of the fact that in consequence of the introduction of the full summer services on July 8, the company is now dealing with its peak normal service for passenger traffic. This test forms part of the "punctuality drive" which is being carried out by Mr. C. R. Byrom, Chief Operating Manager of the L.M.S.R., with a view to maintaining the highest possible standard of passenger train punctuality. Two previous "punctuality days" were held earlier in the year on the basis of the ordinary winter service, but the latest test is the first to be carried out during the summer season. The test showed that the most punctual trains were the suburban electric services, which averaged 99·3 per cent. punctuality; long-distance expresses averaged 98·6 per cent., and steam local passenger trains 97·9 per cent.

Through Roumanian - U.S.S.R. Traffic.—On July 16, a conference was concluded at Odessa between the Roumanian and U.S.S.R. railway authorities agreeing to the resumption of railway traffic between Roumania and Soviet Russia when the reconstruction is completed, probably in August, of the bridge over the Dniester at Tighina, which was destroyed during the war.

Road Accidents.—The Ministry of Transport return for the week ended July 13, 1935, of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year:—

	Killed, including deaths resulting from previous accidents	Injured
England ...	... 105 (124)	4,770 (4,803)
Wales ...	... 6 (6)	227 (237)
Scotland ...	... 16 (13)	549 (542)
	127 (143)	5,546 (5,582)

The total fatalities for the previous week were 121, as compared with 180 for the corresponding period of last year.

West of Scotland Electrification Schemes.—The Glasgow Corporation Finance Committee has a special subcommittee appointed to consider schemes of electrical development for the West Coast of Scotland. On July 10, this body agreed unanimously to prepare schemes for railway electrification for submission to the Government with a view to securing a loan guarantee. It was also decided to ask Mr. Thomas Somers, the Glasgow City Engineer, to prepare a report on electrification schemes. The L.M.S.R. and L.N.E.R. are being invited to send representatives to a future meeting of the committee and the co-operation is also being sought of all town and county council authorities in the West of Scotland.

London Transport Bills.—The Select Committee of the House of Lords, presided over by Lord Iveagh, on July 11 allowed the London Passenger Transport Board Bill to proceed, subject to the Abbey Road Building Society being given a period of three years within which to make a claim for compensation if damage to Abbey House resulted through the construction or working of the proposed new tube railway from Finchley Road to Baker Street, and the right to appoint an engineer to inspect the works while they were in progress. The Bill was reported from the Select Committee, with amendments, on July 15. The London Passenger Transport Board (Finance) Bill was read the third time and passed in the House of Commons on July 11, and was read a first time in the House of Lords.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 28th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,925¼ mls.)						
Passenger-train traffic...	655,000	627,000	+ 28,000	12,615,000	12,302,000	+ 313,000
Merchandise, &c. ...	447,000	430,000	+ 17,000	12,489,000	12,444,000	+ 45,000
Coal and coke ...	178,000	180,000	— 2,000	6,500,000	6,487,000	+ 13,000
Goods-train traffic ...	625,000	610,000	+ 15,000	18,989,000	18,931,000	+ 58,000
Total receipts ...	1,280,000	1,237,000	+ 43,000	31,604,000	31,233,000	+ 371,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	415,000	406,000	+ 9,000	8,176,000	7,961,000	+ 215,000
Merchandise, &c. ...	307,000	288,000	+ 19,000	8,596,000	8,646,000	— 50,000
Coal and coke ...	204,000	207,000	— 3,000	6,262,000	6,405,000	— 143,000
Goods-train traffic ...	511,000	495,000	+ 16,000	14,858,000	15,051,000	— 193,000
Total receipts	926,000	901,000	+ 25,000	23,034,000	23,012,000	+ 22,000
G.W.R. (3,749½ mls.)						
Passenger-train traffic...	264,000	259,000	+ 5,000	5,204,000	5,130,000	+ 74,000
Merchandise, &c. ...	184,000	178,000	+ 6,000	5,046,000	4,994,000	+ 52,000
Coal and coke ...	92,000	89,000	+ 3,000	2,766,000	2,783,000	— 17,000
Goods-train traffic ...	276,000	267,000	+ 9,000	7,812,000	7,777,000	+ 35,000
Total receipts	540,000	526,000	+ 14,000	13,016,000	12,907,000	+ 109,000
S.R. (2,171 mls.)						
Passenger-train traffic...	367,000	345,000	+ 22,000	7,778,000	7,604,000	+ 174,000
Merchandise, &c. ...	63,000	63,000	—	1,683,500	1,785,000	— 101,500
Coal and coke ...	24,000	25,000	— 1,000	837,500	876,000	— 38,500
Goods-train traffic ...	87,000	88,000	— 1,000	2,521,000	2,661,000	— 140,000
Total receipts	454,000	433,000	+ 21,000	10,299,000	10,265,000	+ 34,000
Liverpool Overhead ... (6½ mls.)	1,259	1,161	+ 98	32,277	31,208	+ 1,069
Mersey (4½ mls.) ...	3,984	4,225	— 241	112,789	115,950	— 3,161
*London Passenger Transport Board ...	553,700	542,800	+ 10,900	1,119,700	1,100,400	+ 19,300
IRELAND						
Belfast & C.D. (80 mls.) pass.	5,568	6,795	— 1,227	63,800	64,580	— 780
,, ,, goods	545	389	+ 156	14,017	14,655	— 638
,, ,, total	6,113	7,184	— 1,071	77,817	79,235	— 1,418
Great Northern (543 mls.) pass.	17,150	18,500	— 1,350	267,400	250,450	+ 16,950
,, ,, goods	9,000	7,550	+ 1,450	254,500	242,700	+ 11,800
,, ,, total	26,150	26,050	+ 100	521,900	493,150	+ 28,750
Great Southern (2,124 mls.) pass.	30,354	33,621	— 3,267	622,146	617,905	+ 4,241
,, ,, goods	32,283	28,689	+ 3,594	957,111	895,776	+ 61,335
,, ,, total	62,637	62,310	+ 327	1,579,257	1,513,681	+ 65,576

* 2nd week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

Insurance of Live Stock by Passenger Train

The railway companies of Great Britain have introduced experimentally from July 1 a scheme by which the senders of live stock by passenger train and/or railway-owned road vehicles used for the transport of passenger-rated live stock may insure their animals against injury or death during transit by the prepayment of small premiums. The animals which may be insured and the insurable maximum values covered are:—

Rates of premium	Minimum premium	Maximum amount of insurance a head
Horses (including ponies), 1s. per cent. a head	1s. a head	£10,000
Cattle, 1s. per cent. a head	6d. a head	£5,000
Calves, sheep, and lambs, ½d. a head for each £5 insurance or part thereof	3d. a consignment	£5,000
Pigs, ¾d. a head for each £5 insurance or part thereof	3d. a consignment	£5,000

The insurance covers risk of death or injury (except for disease or destruction due to foot and mouth disease, or under any Contagious Diseases Acts, death or injury caused by persons participating in any railway strike, burning of pigs, *i.e.*, due to alleged contact with disinfectant or to contact with excreta, and bruising unless attention is drawn to the injury on, or before delivery, when consideration will be given to exceptional cases), whilst the animals are in transit, and during loading and unloading. Complaints must be made in writing within three days of delivery and claims within ten days.

The scheme does not apply to through-booked live stock to Ireland, the Channel Islands, Isle of Wight, and all places overseas, nor to live stock from the Western Islands of Scotland, Orkney and Shetland Islands, Ireland, the Channel Islands, Isle of Wight, and all places overseas passing on its initial journey from a port on the mainland.

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices July 17, 1935	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	66½	48½	51	—
5% Con. Prefce. ...	118	109	123½	+1
5% Red. Pref. (1950)	115	107	113½	—
4% Deb.	117	105	115½	—
4½% Deb.... ...	119	109	115½	—
4½% Deb.... ...	129½	115¼	127½	—
5% Deb.	135	126¼	138½	—
2½% Deb.... ...	75	64	78	—
5% Rt. Charge ...	134 7/16	123¼	135½	—
5% Cons. Guar. ...	132¾	121¾	135½	—
L.M.S.R.				
Ord.	30½	19½	22	+½
4% Prefce. (1923)	64¼	41	57	—
4% Prefce. ...	87	69½	84½	+1
5% Red. Pref. (1955)	107	92½	103½	—
4% Deb.	114⅛	100½	107½	+½
5% Red. Deb. (1952)	118 11/16	111¼	115½	—
4% Guar.... ...	106½	96¾	104	+1
L.N.E.R.				
5% Pref. Ord. ...	24¾	13½	12	−¼
Def. Ord.	11½	6⅞	6	−⅛
4% First Prefce. ...	76	59½	65	−½
4% Second Prefce.	47	25½	25	−½
5% Red. Pref. (1955)	94½	80	84⅛	—
4% First Guar. ...	104	92	101	—
4% Second Guar.	97⅞	86½	95	+1
3% Deb.	90	74½	81½	+½
4% Deb.	114	99¼	106	—
5% Red. Deb. (1947)	117	108	113½	—
4½% Sinking Fund Red. Deb.	111¼	105¼	110	—
Southern				
Pref. Ord.... ...	90	63⅛	84	—
Def. Ord.	32⅝	19	23	—
5% Prefce. ...	118 5/16	107½	123	+1
5% Red. Pref. (1964)	115¾	107½	116⅛	—
5% Guar. Prefce.	132	120¾	135½	—
5% Red. Guar. Pref. (1957)	119½	113	119½	—
4% Deb.	116½	103¼	114	—
5% Deb.	134	124 13/16	135½	—
4% Red. Deb. 1962–67	113 11/16	105 9/16	113½	—
Belfast & C.D.				
Ord.	6	5	4	—
Forth Bridge				
4% Deb.	110	100	108½	—
4% Guar.	110	100	107½	—
G. Northern (Ireland)				
Ord.	9¾	4 15/16	14¾	+5¾
G. Southern (Ireland)				
Ord.	25	12½	30	—
Prefce.	21½	13 15/16	43	+4¼
Guar.	48	39	75	+4¾
Deb.	67	59	80	+½
L.P.T.B.				
4½% "A" ...	126	115	124½	—
5% "A"	135½	124½	134½	—
4½% "T.F.A." ...	113½	107½	111	—
5% "B"	131¾	118	127½	—
"C"	97	73	98	−1
Mersey				
Ord.	15¼	7	12	—
4% Perp. Deb. ...	93½	82½	94½*	—
3% Perp. Deb. ...	66½	61½	70½*	+2
3% Perp. Prefce....	54	44½	52½	—

* ex-dividend

CONTRACTS AND TENDERS

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for two bogie inspection saloons for service on the Gold Coast Government Railway.

Wagons for Nigeria

The Birmingham Railway Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for 31 25-ton bogie covered goods wagons for the Nigerian Government Railway.

G. H. Sheffield & Co. (Engineers) Ltd. has received from the Crown Agents for the Colonies an order for 62 Sheffield-Twinberrow bogies complete with wheels and axles and fitted with Framwel axle-boxes for the above-mentioned 25-ton bogie covered goods wagons for the Nigerian Government Railway.

D. Wickham & Co. Ltd. has received orders as follow :—

Nigerian Government Railway : Five metre-gauge petrol-driven trolleys to order of the Crown Agents for the Colonies.

Peruvian Corporation : One 40-seater rail motor bus with Ford V8 petrol engine.

Baraset Light Railway : One 30-seater rail motor chassis.

London & North Eastern Railway : One petrol-driven motor trolley and one trailer.

Great Western Railway : One petrol-driven motor trolley and one trailer.

Rails for China

The Chinese Government Purchasing Commission has placed orders, to the inspection of Messrs. Sandberg, for permanent way equipment for the Peiping-Hankow Railway, as follow :—

Dorman Long & Co. Ltd. : 3,500 metric tons of 42 kg. per metre rails and 210 metric tons of fishplates.

Chas. Richards & Sons Ltd. : 500,000 screw spikes for the above rails.

Guest, Keen & Nettlefolds Limited : 500,000 screw spikes and 50,000 fishbolts and nuts for the above rails.

Ransomes & Rapier Limited has received an order from the South Indian Railway, to the inspection of Messrs. Robt. White & Partners, for two 10-ton hand-operated breakdown cranes mounted on three pairs of wheels and axles for service on the 5 ft. 6 in. gauge.

The South Indian Railway Administration has also placed orders to the inspection of Messrs. Robt. White & Partners as follow :—Premier Steel Tube Co. Ltd. : 1,613 steel boiler tubes ; and Birmingham Battery & Metal Co. Ltd. : 14 tons of copper and brass material.

The Dunlop Tire & Rubber Goods Co. Ltd. of Canada has received orders for the equipping of one day coach for the Canadian National Railways with cellular latex upholstered seats and reversible backs, and Dunlopillo cushions are being fitted to eighty-eight swivel chairs for four lounge cars. Cellular latex cushioning is also being specified in new designs of day coach chairs for the Canadian Pacific Railway, and an order is in hand from the Ottawa Car Manufacturing Company for the equipping of sixteen street cars with deep seat cellular latex cushions and back rests.

Leyland Motors Limited has received from the South African Railways & Harbours Board an order for two Beaver-Six goods vehicles.

New L.M.S.R. Hotel at Leeds

Wm. Airey & Son (Leeds) Ltd. has received the general building contract for the new Queen's Hotel to be erected for the L.M.S.R. at Leeds. Redpath, Brown & Co. Ltd. are the steelwork contractors and C. N. Haden & Sons Ltd. are responsible for the heating, ventilating, and hot and cold water service contract. Further details of this rebuilding scheme, for which the architects are Mr. W. Curtis Green, R.A., and the L.M.S. Railway's architect, Mr. William H. Hamlyn, F.R.I.B.A., will be found on p. 120 of our news section.

The Steel Company of Scotland Limited has received an order from the Assam-Bengal Railway Administration for 102 locomotive tyres to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The Bombay, Baroda & Central India Railway Administration has placed the following orders to the inspection of Messrs. Rendel, Palmer & Tritton :—

Tempered Spring Co. Ltd. : 1,300 helical and 600 volute springs.

Fried Krupp A.G. : 50 locomotive straight axles.

Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. : 26 connecting rods.

Robt. Stephenson & Co. Ltd. : 27 cast steel wheel centres.

The Hunslet Engine Co. Ltd. has in hand an order for one 150-b.h.p. and one 37-b.h.p. diesel locomotives for a manganese mine on the Gold Coast, and for one 37-b.h.p. and two other diesel rail tractors for use on the Kut barrage works being carried out by Balfour, Beatty & Co. Ltd. Two standard gauge 20-b.h.p. diesel shunting tractors are being built for service in this country and one for China.

Siemens (India) Limited has received an order from the East Indian Railway for an X-ray plant at a total price of Rs. 10,366.

Robert Hudson & Co. Ltd. has received an order from the Indian Stores Department for 80 2 ft. 6 in. gauge platform wagons at a total price of Rs. 29,400, free delivery.

J. Stone & Co. Ltd. has received orders from the Indian Stores Department for sets of train lighting equipment, including dynamos, lamp resistances, and switches, at a total price of Rs. 63,742, and 111 railway carriage fans at a total price of Rs. 9,724.

Turner Hoare & Co. Ltd. has received an order from the Indian Stores Department for two sets of combined beacons and floodlights at a total price of Rs. 33,690. Stewart Jacks Limited has also received an order for two sets at a total price of Rs. 26,533.

Craven Bros. (Manchester) Limited has received an order for one portable dome and manhole facing machine for the Buenos Ayres Western Railway.

Hurst Nelson & Co. Ltd. has received an order from the London County Council for four 12-ton coal wagons.

Guest, Keen Williams Limited has received an order from the Great Indian Peninsula Railway for 3,000 fishplates for BH 100-lb. rails.

The International General Electric Co. Ltd. has received an order from the Government of Mysore, Stores Purchase Committee for two 35,000-volt oil circuit breakers at a total price of $4,954 f.a.s. New York.

Wright, Pinhorn & Partners Limited has received an order from the Indian Stores Department for 2,000 screw couplings at a total price of Rs. 24,250.

Pritchett & Gold and E.P.S. Co. Ltd. has received an order from the Indian Stores Department for 28 sets of NIFE train lighting batteries at a total price of Rs. 38,703.

The Associated Locomotive Equipment Co. Ltd. has received orders from the Bengal-Nagpur Railway for sets of poppet valve gear for the conversion of eight K class locomotives.

Orenstein & Koppel A.-G. has received an order from the Egyptian State Railways Administration for tubular barriers for level crossings at a total price of £E.2,689·5.

Alfol Insulation Limited has received an order for sets of Alfol boiler insulation required for the 16 two-cylinder 4-8-4 locomotives under construction by the Vulcan Foundry Co. Ltd. for the Canton-Hankow Railway.

The Timken Roller Bearing Co. Ltd. is to supply roller bearings for the leading bogies and trailing trucks of the two XB class 4-6-2 locomotives which, as recorded in THE RAILWAY GAZETTE of June 21, are to be constructed by the Vulcan Foundry Co. Ltd. for the Madras & Southern Mahratta Railway.

The Egyptian State Railways Administration has placed orders for signalling materials (ref. no. E.S.R. 24,102) as follows :—Westinghouse Brake & Saxby Signal Co. Ltd. : items 1-14, 16 and 20-34, total cost £1,401 10s. 9d. f.o.b. London ; Stewarts & Lloyds Limited : item No. 35, total cost £697, f.o.b. Glasgow ; and W. F. Dennis & Co. : item No. 37, total cost £195, f.o.b. Antwerp, and also for wire, ref. E.S.R. 30.163, total cost £2,550, f.o.b. Antwerp.

Tank Wagons Required for India

The Agent, Assam-Bengal Railway, invites tenders, receivable in Chittagong by February 29, 1936, for 20 metre-gauge, 5,500-gall. bogie petrol tank wagons, IRS MBTP type, complete with vacuum and hand brakes, but without wheels and axles ; also for 10 metre-gauge 2,800-gall. four-wheeled oil tank wagons on IRS MC type underframes and complete with vacuum and hand brakes.

It is reported that the Mozambique Railway Administration is to instal electric signalling and point control on the Lourenço Marques-Moamba section.

OFFICIAL NOTICES

WANTED for large European firm of Engineers in India, a Senior Estimator and Designer in the Bridge and Structural Department. Applicants should be of good address and education, and possess practical workshop experience and sound knowledge of design of steel bridges and structures. Preference will be given to those holding B.Sc. (London) or equivalent degrees. Age between 25 and 30. First agreement will be for a period of five years. Applications by letter, with copies of references and details of experience, stating age and whether married or single, to "E. & D.," c/o W. Abbott Limited, 32 Eastcheap, London, E.C.3.

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

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RAILWAY AND OTHER REPORTS

Costa Rica Railway.—The report for the year to June 30, 1935, the thirtieth year of the working of the company's railway by the Northern Railway Company, shows that the rental dealt with in terms of the working agreement was £137,100, plus interest on investments, transfer fees, &c., £13,927, and £19,147 brought forward, making a total of £170,174. After providing for debenture interest, directors' fees, expenses of administration, income tax, Costa Rica Government taxes, and £3,000 for debenture redemption sinking fund, there is a balance of £65,176. The directors recommend a dividend of 2 per cent. on the capital stock (which will absorb £36,000), a transfer of £26,024 to reserve (which will raise that fund to £300,000), and that the balance of £3,152 be carried forward.

Aldershot & District Traction Co. Ltd.—This company, which is controlled jointly by the Southern Railway Company and Tilling & British Automobile Traction Limited, secured during the year ended May 31, 1935, traffic receipts and other revenues amounting to £314,908, as compared with £302,626 for 1934-35. After deducting all expenses chargeable to revenue, including depreciation, and after transferring £17,000 (against £5,000) to general reserve, there remains a balance of £16,078, which added to £16,554 brought forward from last year, leaves an available balance of £32,632 (against £31,554). The directors recommend a dividend of 8 per cent. (against 7½ per cent.) on the share capital, which will absorb £16,000 and leave £16,632 to be carried forward.

Anglo-Argentine Tramways Co. Ltd.—On the basis of conversion at the average free market for the year, gross receipts for the year 1934 amounted to £1,655,244 and expenses to £1,708,897, leaving a deficit of £53,653. Gross receipts in currency were 5·71 per cent. less than in 1933, but expenses in currency advanced by 1·25 per cent.; the increase was due to heavier renewal and maintenance works and to greater traffic and traction costs on account of extra mileage. This additional mileage, undertaken in the last four months of the year, checked for the first time since 1928 the downward tendency of the passenger traffic. Competition and traffic congestion have been greater than in any previous year, due principally to the increase in the number and carrying capacity of taxibuses, all of which now seat 11 passengers, and to reductions in their fares. The Bill for co-ordination of transport in the City of Buenos Aires and its surroundings is now before the Chamber of Deputies, and will, if approved by that assembly during the present session, be submitted to the sanction of the Senate.

Sentinel Waggon Works Limited.—The report states that although trading conditions appeared to have improved during the early months of 1934 business fell away rapidly during the later months, and a considerable loss for the year has resulted. The position continued to deteriorate during the current year, and on April 15 last the company's bankers, acting under powers granted in a charge created on July 30, 1934, appointed a receiver and manager in order to enforce their security. The loss on trading for the year, after meeting interest, directors' fees, &c., amounted to £38,623. In an attempt to maintain its position against its competitors the company has continued to spend considerable sums on experimental and development work, mainly concerned with the railway side of its business. Although these developments have come near to the stage where profits could be anticipated, the fall in the company's trade has involved losses and depleted funds required to complete and market new productions. Negotiations are, however, in progress with a view to the reconstruction of the company involving the provision of additional finance.

Port of Bristol Authority.—Income of the Authority for the year ended March 31, 1935, amounted to £805,972, of which £378,658 came from dock and city dues, including £157,408 from vessels and £214,046 from goods. In the traffic department the sum of £247,670 was received for discharging and loading vessels, landing and shipping cargo; from the railway companies in respect of interchanged traffic the amount received was £15,039; and rents, &c., in the warehouse department brought in £87,687. Expenditure amounted to £497,456, leaving £308,516 to be carried to net revenue account. With the aid of sundry credits and of £40,000 from the general rate, interest and sinking fund charges, &c., are covered, and the sum of £5,000 is transferred to renewal account, leaving a balance of £14,202 to be carried to the balance sheet.

Forthcoming Meetings

July 19 (*Fri.*)—**Egyptian Delta Light Railways Co. Ltd.** (Annual General), Winchester House, Old Broad Street, E.C., at 12 noon.

July 22 (*Mon.*).—**Costa Rica Railway Co. Ltd.** (Ordinary General), Winchester House, Old Broad Street, E.C., at 11 a.m.

July 22 (*Mon.*)—**Leopoldina Railway Co. Ltd.** (Ordinary General), River Plate House, Finsbury Circus, E.C., at 12 noon.

July 24 (*Wed.*)—**Bombay, Baroda and Central India Railway Company** (General), Southern House, Cannon Street, E.C., at 1 p.m.

Exports of Railway Material from the U.K. in June

	June, 1935	June, 1934	Six Months Ending June, 1935	Six Months Ending June, 1934
	£	£	£	£
Locomotives, rail	21,654	23,948	294,682	143,184
Carriages and wagons	77,926	61,388	537,781	346,693
Rails, steel	56,535	177,721	321,125	421,195
Wheels, sleepers, fishplates and miscellaneous materials	196,645	126,400	801,837	456,015

Locomotive and rail exports included the following:—

	Locomotives		Rails	
	June, 1935	June, 1934	June, 1935	June, 1934
	£	£	£	£
Argentina	—	—	5,806	5,773
Union of South Africa	—	—	51,384	58,748
British India	12,422	1,795	33,442	38,870

XUM

Railway Share Market

In the stock and share markets the rapid approach of the holiday period is being reflected in the volume of business. Traffic receipts of the railways on Wednesday were virtually without influence, although there was no fault to be found with the trend of the returns which showed good increases in each of the four railways. Southern deferred ordinary responded to the increase of £21,000, which was better than had been anticipated and was regarded as foreshadowing further big increases during the ensuing two months as a result of the latest electrification to the coastal towns.

London Midland & Scottish ordinary and preference stocks have kept firm on expectations of a favourable decision by the directors regarding the payment of a half-year's dividend on the redeemable preference stock. The 1923 preference stock was again active as scope for appreciation is considered to be the largest in this stock which is entitled to 4 per cent. It is estimated that part of this dividend is now being earned, and that the full rate of dividend would be possible if the company were to obtain some rating relief. Prior charge stocks of the companies were firm and were apparently unaffected by the competition of the new £32 million Transport loan, which had a good reception in the City. The low rate of interest provided by the latter loan has emphasised the high yield which holders of home railway debenture stocks are receiving, although they are necessarily without the backing of the Government guarantee. The yield of 2½ per cent on the new loan is about 20s. to 30s. per cent. less than is obtainable on home railway debenture stocks, which are well covered by revenue, Great Western 4 per cent. debenture stock gives a yield of £3 8s. 9d. at the current buying price, Southern 4 per cent. debenture stock a yield of £3 9s. 6d., L.M.S. 4 per cent. debenture stock a yield of £3 14s. 3d. per cent. and L.N.E. 4 per cent. debenture stock a yield of £3 14s. 6d.

Default has never taken place on any of these stocks, and is not considered likely to occur even if conditions were to get much worse instead of better. They should prove good stocks for "mixing" with the new 2½ per cent. Transport loan by those investors who wish to obtain an average return of not less than 3 per cent. from trustee securities with a long "life."

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1934-35	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1934	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1934	Prices: Lowest 1934	Prices: July 17, 1935	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	14.7.35	13,820	— 5,180	28	347,800	371,070	— 23,270	Ord. Stk.	26¾	19	20	Nil
	Argentine North Eastern	753	13.7.35	8,684	+ 932	2	15,286	15,368	— 82	"	11	6⅞	7	Nil
	Argentine Transandine	111	—	—	—	—	—	—	—	A. Deb.	52	45	47½	8 7/16
	Bolivar	174	June, 1935	6,000	+ 900	26	39,400	38,750	+ 650	6 p.c. Deb.	10	6½	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	13¾	10 7/16	13	3 15/16
	Buenos Ayres & Pacific	2,806	13.7.35	72,679	+ 1,406	2	142,520	141,474	+ 1,046	Ord. Stk.	16½	8½	9½	Nil
	Buenos Ayres Central	190	30.6.35	$117,200	— $16,600	52	$5,776,800	$5,584,400	+ $192,400	Mt. Deb.	23	10	16	Nil
	Buenos Ayres Gt. Southern	5,085	13.7.35	108,226	— 776	2	215,163	230,440	— 15,277	Ord. Stk.	35	22	23	Nil
	Buenos Ayres Western	1,930	13.7.35	43,537	+ 876	2	81,044	88,610	— 7,566	"	27½	18½	19	Nil
	Central Argentine	3,700	13.7.35	125,129	+ 3,670	2	237,542	246,786	— 9,244	"	23	13½	13½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	14	7	8	Nil
	Cent. Uruguay of M. Video	273	13.7.35	8,457	— 7,471	2	16,506	34,179	— 17,673	Ord. Stk.	15½	8	4½	Nil
	Do. Eastern Extn.	311	13.7.35	1,639	+ 236	2	2,852	2,789	+ 63	—	—	—	—	—
	Do. Northern Extn.	185	13.7.35	1,163	+ 268	2	2,081	1,801	+ 280	—	—	—	—	—
	Do. Western Extn.	211	13.7.35	519	— 11	2	939	1,036	— 97	—	—	—	—	—
	Cordoba Central	1,218	13.7.35	36,370	+ 1,560	2	70,000	70,910	— 910	Ord. Inc.	6	3	2½	Nil
	Costa Rica	188	May, 1935	13,867	— 2,792	48	176,238	197,823	— 21,585	Stk.	30¾	23½	32	6¼
	Dorada	70	June, 1935	11,800	+ 3,000	26	66,800	60,200	+ 6,600	1 Mt. Db.	103	95	102½	5⅞
	Entre Rios	810	13.7.35	11,645	+ 1,399	2	22,015	19,764	+ 2,251	Ord. Stk.	2½	12	11½	Nil
	Great Western of Brazil	1,082	13.7.35	5,300	— 500	28	222,200	221,600	+ 600	Ord. Sh.	⅞	5/8	1/2	Nil
	International of Cl. Amer.	794	May, 1935	$497,050	+ $21,927	21	$2,260,638	$2,466,672	— $206,034	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/-	1/-	1/2	Nil
	La Guaira & Caracas	22¾	June, 1935	3,915	+ 35	26	23,845	21,435	+ 2,410	Stk.	12¾	7⅝	8½	Nil
	Leopoldina	1,918	13.7.35	28,560	+ 2,273	28	620,011	609,395	+ 10,616	Ord. Stk.	14⅝	7	4	Nil
	Mexican	483	7.7.35	$231,400	+ $14,500	1	$231,400	$216,900	+ $14,500	"	3¼	1½	1	Nil
	Midland of Uruguay	319	June, 1935	5,800	— 2,399	52	109,846	111,908	— 2,062	"	1½	1/2	1½	Nil
	Nitrate	401	15.7.35	8,481	+ 4,591	28	80,994	80,588	+ 406	Ord. Sh.	3 29/32	51/-	2⅜	Nil
	Paraguay Central	274	13.7.35	$1,924,000	+ $1,038,000	2	$3,516,000	$1,822,000	+ $1,694,000	Pr. Li. Stk.	84	67	73 25/8	8 5/16
	Peruvian Corporation	1,059	June, 1935	66,756	+ 11,914	52	764,032	674,250	+ 89,782	Pref.	14½	8	8	Nil
	Salvador	100	6.7.35	¢10,136	— ¢2,114	1	¢8,688	¢12,250	— ¢3,562	Pr. Li. Db.	75	70	65	7 11/16
	San Paulo	153½	7.7.35	21,833	— 7,432	27	687,155	754,321	— 67,166	Ord. Stk.	86	67	48	5 5/16
	Taltal	164	June, 1935	2,875	+ 657	52	36,940	27,268	+ 9,672	Ord. Sh.	2⅛	1 7/16	1½	6 11/16
	United of Havana	1,365	13.7.35	20,404	+ 5,112	2	36,119	33,003	+ 3,116	Ord. Stk.	6	2	2½	Nil
	Uruguay Northern	73	June, 1935	608	— 370	52	11,946	13,533	— 1,587	Deb. Stk.	6¼	3	4½	Nil
Canada.	Canadian National	23,735	7.7.35	614,310	+ 8,771	27	16,642,974	16,504,888	+ 138,086	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	78½	51½	55½	7 5/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104½	97¼	100½	3 15/16
	Canadian Pacific	17,211	7.7.35	487,800	+ 19,400	27	11,793,400	11,910,600	— 117,200	Ord. Stk.	18 5/16	11 1/16	10	Nil
India.†	Assam Bengal	1,329	20.6.35	35,685	— 1,952	11	262,485	322,804	— 60,319	Ord. Stk.	88½	72	83½	3 9/16
	Barsi Light	202	20.6.35	3,435	— 412	11	30,795	37,215	— 6,420	Ord. Sh.	104½	98¾	90½	6 1/16
	Bengal & North Western	2,114	30.6.35	66,057	— 9,231	13	685,130	732,135	— 47,005	Ord. Stk.	297½	262	294½	5 7/16
	Bengal Dooars & Extension	161	20.6.35	3,787	— 181	11	25,072	28,246	— 3,174	"	125¼	124	125½	5 9/16
	Bengal-Nagpur	3,268	10.6.35	168,675	— 3,710	10	1,288,200	1,257,571	+ 30,629	"	105½	96	102½	3⅞
	Bombay, Baroda & Cl. India	3,072	10.7.35	203,475	— 16,725	15	2,367,000	2,365,275	+ 1,725	"	115	108½	113½	5 5/16
	Madras & South'n Mahratta	3,230	20.6.35	150,975	— 17,568	11	1,261,875	1,444,915	— 183,040	"	131	122¾	121½	7 15/16
	Rohilkund & Kumaon	572	30.6.35	12,755	+ 76	13	136,041	144,881	— 8,840	"	263	250	287½	5 9/16
	South India	2,526	20.6.35	122,673	+ 4,923	11	930,559	963,218	— 32,659	"	119	115	117½	6 15/16
Various.	Beira-Umtali	204	May, 1935	70,053	+ 11,181	34	520,214	399,848	+ 120,366	—	—	—	—	—
	Bilbao River & Cantabrian	15	June, 1935	1,261	— 97	26	9,905	10,459	— 554	—	—	—	—	—
	Egyptian Delta	622	30.6.35	4,921	— 157	13	46,629	47,103	— 474	Prf. Sh.	2 15/16	1¾	1⅞	5 5/16
	Great Southern of Spain	104	6.7.35	1,098	— 223	27	42,687	57,626	— 7,939	Inc. Deb.	4	3½	3½	Nil
	Kenya & Uganda	1,625	June, 1935	165,532	— 7,047	26	1,292,777	1,222,928	+ 69,849	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	41	8½
	Mashonaland	913	May, 1935	125,884	+ 19,026	34	945,921	731,020	+ 214,901	1 Mg. Db.	101	91¾	103	4⅞
	Midland of W. Australia	277	May, 1935	13,048	+ 912	48	147,834	146,176	+ 1,658	Inc. Deb.	100	93	94½	5 5/16
	Nigerian	1,905	1.6.35	22,145	— 7,220	9	243,065	245,566	— 2,501	—	—	—	—	—
	Rhodesia	1,538	May, 1935	198,403	+ 26,795	34	1,540,983	1,234,884	+ 306,099	4 p.c. Db.	104⅞	97½	104	3 15/16
	South African	13,217	22.6.35	529,224	+ 4,094	12	6,376,355	5,784,520	+ 591 835	—	—	—	—	—
	Victorian	6,172	Feb., 1935	753,986	— 19,539	34	6,340,598	6,162,144	+ 178,454	—	—	—	—	—
	Zafra & Huelva	112	May, 1935	10,848	— 233	21	55,398	55,722	— 324	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value